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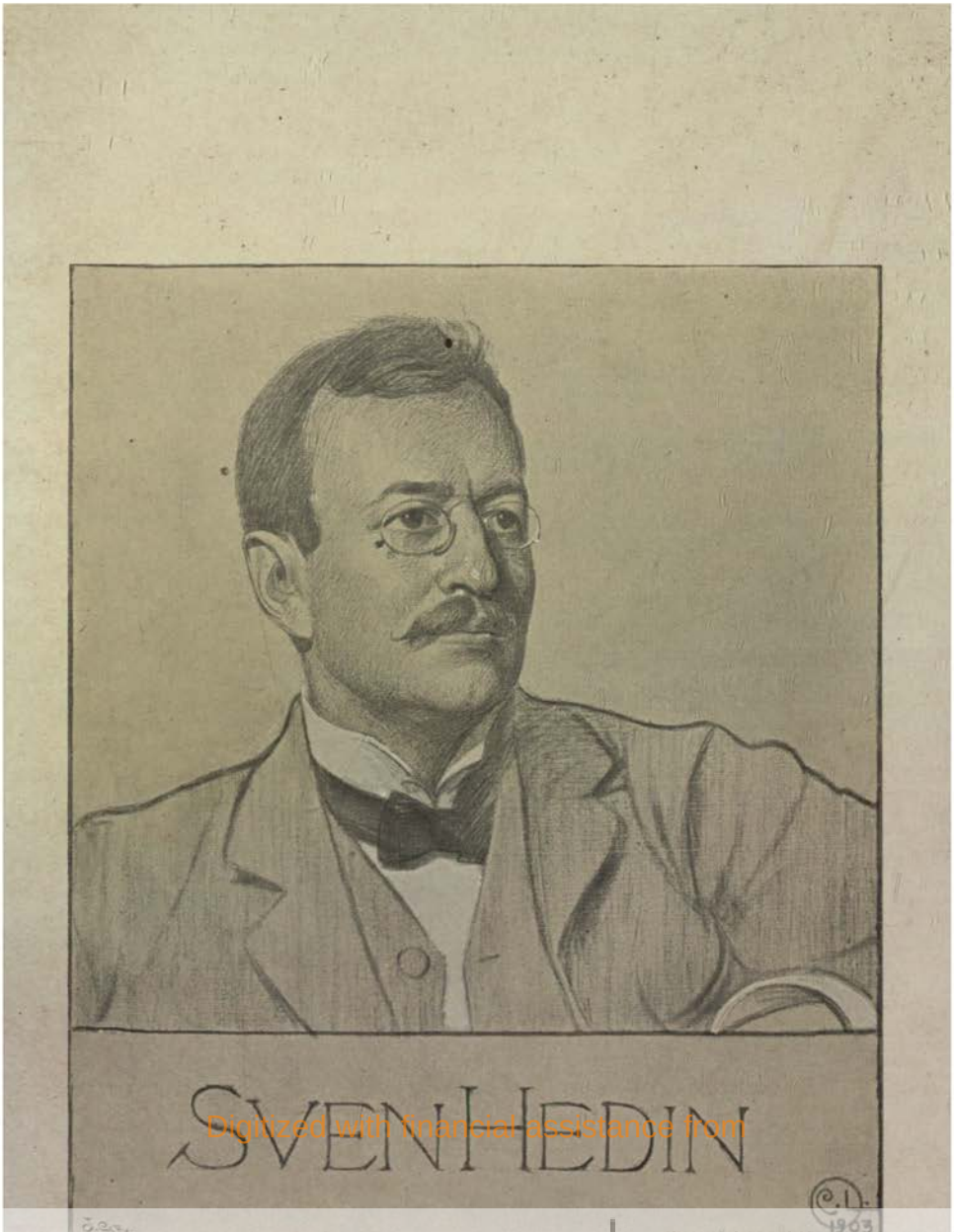

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CENTRAL ASIA AND TIBET

Towards the Holy City of Lassa

BY

SVEN HEDIN

Author of "Through Asia," etc.

65946

With 420 Illustrations from Drawings and Photographs, Eight Full-page Coloured Illustrations from Paintings, and Five Maps, mostly by the Author

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Dedication.

THE ENGLISH AND AMERICAN EDITIONS
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TO
HIS EXCELLENCY
LORD CURZON OF KEDLESTON,
VICEROY OF INDIA,
WITH GRATITUDE AND ADMIRATION
BY THE AUTHOR.

915

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PREFACE.

In offering, as I do in the following pages, the results of my latest travels in Central Asia to the English-speaking world, my first duty must be to thank all those who have in various ways contributed to the success of the journey. In the first place, my sincere and earnest thanks must be tendered to His Majesty King Oscar of Sweden and Norway. With his accustomed generosity and enlightenment he made possible the inception of an undertaking, the success of which was in no slight degree due to his valuable assistance and his distinguished patronage. During the many years which I have devoted to the exploration of the little-known interior of Asia His Majesty has always followed my movements with the warmest interest and sympathy, graciously encouraging me to fresh efforts, and honouring me in the most flattering way after each new success. To him, therefore, I desire to express my deepest and most heartfelt gratitude.

To His Imperial Majesty the Czar of Russia I also owe a heavy debt of gratitude for the invaluable support he was pleased to afford me. The services which his Cossacks rendered me were such as money alone could not repay. In my caravan there was not the faintest echo of those bloody and hostile passages which in the past have more than once clouded the relations between Swedes and Russians. Seldom have I been served with such signal devotion and zeal as I was during the three years I had the good fortune to have associated with me these four Cossacks of the Czar's great army. At the same time may I also express my heartfelt thanks to His Excellency, General Kuropatkin, Russian Minister of War, for the valuable assistance he so kindly rendered me? After the very substantial help which King Oscar so generously gave me by way of a start, I experienced no difficulty in raising the funds necessary for my journey, long and important though it was. I had no need to appeal to any except my own countrymen; and amongst them I had on this, as on former occasions, no more liberal friend than M. Emanuel Nobel, of St. Petersburg.

The Swedish edition of this book I have dedicated to my deeply revered parents, as a slight token of the love and affection I owe them

for all they have done for me in the past. By a happy inspiration, I have asked, and obtained, the kind permission of His Excellency, Lord Curzon, Viceroy of India, to dedicate to him the English-American edition. It affords me the sincerest pleasure thus publicly to thank him for the truly magnificent hospitality which he and Lady Curzon showed me when I was in Calcutta and Barrackpur. It was owing to Lord Curzon's influential favour that my visit in India turned out so exceedingly pleasurable, in fact, I shall never forget it. But whilst thus tendering the evidence of my gratitude to the able and successful administrator, I desire also, by my dedication of the book to Lord Curzon, to express my admiration for the learned geographer, and, at the same time, render my homage to one who is counted amongst the profoundest of living students of the geography and politics of Asia. I congratulate the powerful empire which has such posts as the Viceroyalty of India to bestow upon the noblest and best of her sons; I congratulate her still more in having sons like Lord Curzon to whom she can entrust the rule of a dependency compared with which most of even the Great Powers of Europe are but as pigmies beside a giant.

It also affords me great pleasure to offer my respectful thanks to the *Royal Geographical Society* for the distinguished and flattering reception it has always accorded to me, for the unique and highly valued honours it has bestowed upon me, and for the proofs of hospitality, sympathy, and kindness with which I have been overwhelmed by those of its members with whom I have had the good fortune to be brought into contact, but more especially to Sir Clements R. Markham, its esteemed president, and Dr. J. Scott Keltie, its valued secretary. By both the officers and members of the Royal Scottish Geographical Society I have been no less honoured and encouraged; and herewith I tender to them also my heartfelt thanks.

This book cannot claim to be anything more than a digested and ordered diary of my latest travels in Asia, together with a description of the regions which I have crossed and recrossed to an added total of some six thousand English miles. If the narrative should be found somewhat heavy and lacking in variety—it will be an exact counterpart of the regions I have travelled through. Travel in Asia is not a dance upon the dropping petals of the rose. Life, with the slow-moving caravans of its boundless deserts and untrodden mountain solitudes, cannot help being monotonous. I have, however, tried to convey an impression of the manner of life, and of how the days pass, amid the lonely desolation of those illimitable wastes. And in any case my labours bring their own reward, in the consciousness that they have contributed, in some degree at least, to the advancement of human knowledge.

In this book I have contented myself with merely an occasional

glance at the scientific results of the journey. The fuller and detailed account of them is reserved for a separate work, to which I would like to be allowed to refer the reader who is interested in the geography of Central Asia. The work in question will appear in the course of the next three years, and will be accompanied by an atlas in a couple of folio vols. I shall be happy to answer any inquiries about the *Scientific Results*, as well as to enrol the names of subscribers; for the production of the work must necessarily be costly, and its success will, of course, depend upon the number of subscribers who come forward.

As I can make no pretensions to being either a historical or an archæological scholar, I have seen fit to quote the opinions of two gentlemen, who are well conversant with such subjects, with regard to the ruins of the ancient towns that I had the good fortune to discover beside the ancient lake of Lop-nor. I allude to Professor Himly, of Wiesbaden, and Mr. Macartney, Agent of the Government of India at Kashgar. Dr. M. A. Stein's *Sand-buried Ruins of Khotan* did not, unfortunately, appear in time for me to refer to it in the text. Nevertheless it cannot be overlooked. It is a work which is as admirable in execution as it is important for the valuable matter it contains. Indeed, it would not be easy to conceive an abler survey, at once clear and full of the keenest insight, of the historic and archæological problems connected with Central Asia. It is certain to mark an era in the investigation of that part of the world. This classic production —for such it is bound to become—cannot be too warmly recommended. The great admiration I have for it must be my excuse for dwelling for a moment upon one or two of the numerous fascinating topics it suggests.

In the first place I desire to acknowledge the loyal spirit in which Dr. Stein has recognised my claim to be the first discoverer of Dandan Uiliq (though I confess I never heard this name applied to the site), and of Kara-dung. With regard to the shifting of the Keriya-daria towards the east, I would refer to my paper in *Petermann's Mitteilungen*, Ergänzungsheft, No. 131, p. 37 (1900). The following pages will afford abundant proofs of the tendency of the rivers of East Turkestan to shift their beds. Had Dr. Stein enjoyed the same opportunities that I have had for studying their courses, and the rapid alterations they undergo, he would have found nothing surprising in the fact that the Keriya-daria has shifted its course $23\frac{1}{2}$ miles further to the east. That is a movement which would require for its accomplishment neither centuries nor thousands of years. Once the bed of an East Turkestan river gets choked with mud, it is only a question of a comparatively few years for it to alter its course.

The detailed results of my investigations on the Mus-tagh-ata, and the Eastern Pamirs generally, are not yet published, but they will, I trust, be published ere long. The materials which I collected for

a map of the region are at this moment in the hands of the geographical firm of Justus Perthes in Gotha; in fact, I have made an arrangement with them to publish the whole in another separate monograph of the well-known *Petermann's Mitteilungen.*

Dr. Stein is to be congratulated upon having exposed the scandalous fabrication of "ancient MSS." which for a time went on wholesale in Khotan. Fortunately he discovered it before more serious or more mischievous results were able to ensue.

I ought perhaps to state that the reasons why I so seldom advert to the travels of my predecessors and contemporaries in the same parts of the world have not been either forgetfulness or want of due recognition of them; but simply because my own materials have been so voluminous that the requisite space has been wanting.

Finally, I must thank my publishers, Messrs. Hurst and Blackett, for the generous and obliging spirit in which they have met me throughout. They are issuing the book in what I can only describe as a first-class manner, and I trust the result will amply compensate them for the trouble and sacrifices they have made.

The present book has been translated by Mr. J. T. Bealby, the same gentleman who so ably translated *Through Asia.* To him also I desire to offer my sincere thanks for the painstaking and diligent care he has bestowed upon the English rendering. Unless I am mistaken, it is an excellent piece of work.

SVEN HEDIN.

Stockholm,
21st August, 1903.

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KEY TO THE TRANSLITERATION OF THE MAP-NAMES.

å	on the map	is rendered by	o	in the text.	
ch	„	„	kh	„	
dj	„	„	j	„	
e (final)	„	„	eh	„	
g (final)	„	(sometimes)	gh	„	(e.g. tagh)
gi	„	rendered	ghi	„	
j	„	„	y or i	„	
s	„	(generally)	z	„	
sch	„	rendered	sh	„	
tj	„	„	ch (as in "church")		
tsch	„	„	tch or ch		

Introduction.

Stockholm to Kashgar.

CHAPTER I.

FROM STOCKHOLM TO OSH.

It was midsummer day in 1899, and our Northern summer was looking its very best—the lilacs in bloom and the trees full of leaf—when I left Stockholm for the fourth time, bound for the heart of Asia. In honour of the day the shipping in the harbour was decorated with flags and bunting, and merrily it fluttered in the breeze that came in crisply off the Baltic. Nobody was down on the pier to see me off except my father and mother, brothers and sisters, and a few intimate friends, when the *Uleåborg* slipped quietly away, carrying me the first stage on my long and adventurous journey. Whatever vicissitudes I may have encountered, whatever privations I may have undergone, during the three following years, nothing was harder to bear than the wrench of that first day. To tear myself away from the place where all my affections have been rooted since infancy demanded far greater resolution than any effort I was called upon to put forth by the contingencies of subsequent travel. But, the bitterness of leave-taking over, a pleasant surprise awaited me. I found amongst the passengers on board my old friend and teacher, Professor Brögger. His company greatly cheered me, and helped me to shake off the depression of spirits which had naturally come over me.

For this journey my equipment was incomparably greater and more complete than on any previous occasion. All told, my baggage weighed no less than 22 cwt., and was stowed away in two dozen cases, most of them specially made for convenience of transport on the backs of horses. A list of the instruments I took with me, as well as some brief mention of the more important items in my equipment, will be found in the subjoined footnote.*

* The astronomical instruments consisted of a Universal Traveller's Theodolite by Hildebrand and three chronometers, two of which came from V. Kullberg in London.

The cost of carrying such a quantity of baggage by passenger train right across Russia, Caucasia, Transcaspia, and West Turkestan, a distance of 3,200 miles, would of course have amounted to a considerable sum. But it did not cost me a single penny. His Majesty the Czar was so interested in my journey that not only did he grant me a free pass for myself and my baggage over the whole of the Russian railway system, but he directed that my belongings should enter and leave the

These instruments, although requiring, under all circumstances, the greatest care and the most delicate handling, suffered no harm whatever throughout the journey, and were just as good at the end of it as they were at the beginning. My topographical instruments embraced a levelling tube, with staff-scales and other accessories, a levelling mirror, tape, compasses, a prismatic compass, with dioptric fittings, and a plane-table with stand and diopter. I had two first-rate velocity instruments made in Stockholm, which could also be used when rowing. The meteorological equipment was almost entirely supplied by Fuess, of Berlin, and consisted of a hypsometer, five boiling-point thermometers, an Assmann's ventilated psychrometer, a couple of actinometers, an anemometer, a rain-gaugg, and a large number of ordinary thermometers, wet-bulb thermometers, maximum and minimum thermometers, thermometers for investigating the temperature of the soil, etc. The Royal Nautical Meteorological Office in Stockholm kindly lent me a deep-sea thermometer with capsule and reversing propeller. The self-registering barometer and self-registering thermometer, each to run fourteen days, were specially made for me by J. Richard, of Paris; and both worked splendidly. One great advantage they possessed was that their glass cases fitted so closely that neither sand storm nor atmospheric dust was able to penetrate into them and impair their working efficiency. On the other hand I had, on this score, a good deal of trouble with the ventilated psychrometer. I used three areometers of Stockholm make, which answered well, except that their graduation might have been better adapted to the altogether exceptional salinity of the Tibetan lakes. Although I took with me no less than 58 pairs of spectacles, very few came back whole. The clouded spectacles for use amongst snow, and tinted various shades of grey and blue, some also with unground glass, were in great demand amongst the men of my various caravans and with the natives generally. I carried the same weapons, a gift of the head of the famous Husqvarna small-arms factory, which I used in 1893-97. The same gentleman further presented to me for this journey four Swedish army officers' revolvers, a large number of smaller weapons of the same kind—these were chiefly intended as presents for native chiefs and others—and a plentiful supply of ammunition. The four Cossacks used their own new Russian army magazine rifles, so that altogether we possessed the somewhat imposing force of ten rifles and a score of revolvers.

Amongst my remaining equipment I have space to mention only a few articles, such as a folding bed from a Malmö firm, which I used in summer; in winter, and whilst journeying through Tibet, I generally slept on the ground. I have very special satisfaction in mentioning the James Patent Folding Boat, which I obtained from the Military Equipment Stores and Tortoise Tents Company of London. It consisted of two sections, which, when in use, were joined together, the whole making a very light load for one horse; indeed, the boat was so light a man could carry it. Its appurtenances embraced two oars with rowlocks, mast, sail, and two life-buoys. On various occasions this little boat not only proved of inestimable service, it also afforded me many an hour's genuine pleasure, as the following pages will abundantly show.

My photographic equipment was by the same maker as before, and answered in every respect admirably. I also had with me a Watson's camera, the identically same instru-

empire without payment of customs. This meant an appreciable lightening of the expenses of my journey; and it meant also a great gain in both comfort and prestige.

From the 26th to the 30th June I stayed in St. Petersburg, enjoying the hospitality and unwearied, kind offices of the Swedish representative at the Russian court, M. Reuterskiöld. My sincere sorrow may therefore be conceived when, only one week later, I learned of his sudden and unexpected death. And here I would desire to express how great a debt of gratitude I owe to the new Swedish minister who succeeded him, Count August Gyldenstolpe, for the obliging assistance he rendered

ment which lay buried for nearly a year under the sand of the Takla-makan Desert. But besides these I was also provided with a Richard's Verascope camera, in every respect a superior type of instrument; a Kodak junior, and a Daylight Kodak, both from Eastman. The lenses I used were the very best that could be obtained; and the plates, which made the heaviest item in my baggage, were Edwards's *anti-halo*. As I also provided myself with a complete stock of chemicals and appliances for developing, fixing and printing negatives, I developed myself the greater portion of those I took (some 2,500 in all) at various times during the course of the journey. Upon reaching home I still had 700 plates left to develop.

Finally I may mention a number of small things, such as knives, daggers, chains, watches, compasses, musical boxes, etc., etc., which were intended as presents to the natives. A first-class Eskilstuna knife is valued in Central Asia at a great deal more than its monetary value. In many cases gifts of this character are more esteemed than hard cash, and they also have this advantage, that they are cheaper.

My stock of stationery, paper for mapping, diaries and note-books, writing materials, dry ink, and so forth, also made up a pretty heavy packet, as will be more easily understood when I state that my maps filled 1,149 sheets and my diaries extended to 4,500 pages.

For the conveyance of the more fragile and perishable of my effects I got a Stockholm firm to make me six trunks, with water-tight casings and cork framework. These were light and strong and suffered no injury, whereas wood or iron would not have stood the racketting. Another firm in the same city provided me with a strong case fitted with 300 test-tubes for holding various natural history preparations.

In the way of edible stores I carried eight cases of preserved foods, which proved of immense service, especially such delicacies as turtle, "Emperor," and ox-tail soups, which only required to be heated over the fire just as they were in their tins. Then, for giving flavour and body to a soup made of mutton or antelope flesh, there was nothing to beat Liebig's *Extract of Meat*.

I also took with me a few books, *e.g.*, a Bible, Psalm Book, and a small book of devotion called *Dagens Lösen (Good Thoughts for Every Day)*, which formed a link between me and dear ones at home. Besides these, I had Supan's *Grundzüge der physischen Erdkunde*, Geikie's *Great Ice Age*, Hann's *Klimatologie*, Kern's *Buddhismus*, Rhys-Davids's *Buddhism*, and two or three scientific works of reference, as well as Odhner's *Svenska Historia* (*History of Sweden*) and a few books of light literature. A separate portfolio contained copies of every map of Central Asia that had been published by previous travellers in that region. By the help of these I was enabled not only to avoid going over their routes again, but also to confine my own energies almost entirely to breaking fresh ground.

me, and the great patience with which he watched over and furthered my interests in St. Petersburg, both at this initial stage of my journey and all through the three years of its continuance. My friend M. Emanuel Nobel gave me his generous assistance, and further crowned his kindness by arranging that I should be able to draw what money I needed at the branch of the Volga-Kama Bank in Tashkend.

The pleasure of my stay in St. Petersburg was greatly enhanced by daily intercourse with my old benefactor and friend, Baron Adolf Nordenskiöld, who also was at that time visiting in the Russian capital. Little did I anticipate that that was the last time I should see him! He also was carried off during my absence from home, to the deep sorrow of all who loved and admired him, a loss to our country and an irreparable loss to science.

I will not dwell upon my journey through Russia. The country has been already sufficiently described by myself and others. But I will hasten to reach the scene of my new experiences and my new geographical discoveries.

My last months in Stockholm had been a time of strenuous, hard work. It was therefore delicious to rest, stretched at full length in my comfortable berth in the train, free from the correcting of proofs, the answering of telephone calls, the sending of wires, the reading of newspapers, and the thousand and one demands which civilized life makes upon a man's time and thought. Delicious to let my mind dream on unchecked and weave plans for the future, as one straw-thatched village after another swept pass me, and one copper-green bulb-shaped church tower after another peeped up on the horizon, flew past, and disappeared again. Meanwhile every beat of the engine piston was bringing me nearer and nearer to my goal.

Before us, behind us, and around us, as far as the eye could reach, stretched the monotonous steppes of Russia, forming a gently undulating or rather almost perfectly level expanse of green—green in all its shades. The hay was already cut, and the face of the country was dotted with endless rows of haycocks. Flourishing corn-fields alternated with the shorn meadows. No trace or sign here of the famine which prevailed in the eastern governments of the empire. My route was *viâ* Moscow, Voronezh, and Rostoff, over the majestic Don, and so on to Vladikavkaz—the same route I followed on my first journey south in 1885. But this time I turned east at Beslan, one

station north of Vladikavkaz, and proceeded towards the Caspian Sea, and thus skirted the northern foot of the gigantic mountain-wall which shot up its peaks and crests into the thin air to the south, its sides streaked with snowfields, its summits wreathed in fantastically-shaped clouds. The surface sank slowly towards the sea, and the railway gradually deviated from the mountains. It was a little after seven (3rd July) when we left Beslan; but, owing to the more southerly latitude, the sun had already set. The sky rapidly flushed into a deep purple, and shortly afterwards it became intensely dark. My thoughts flew back to our bright and joyous summer nights at home, which I was destined not to enjoy again for many and many a month. As we ran down towards the largest inland sea in the world, the blackness of the night was from time to time illumined by the flashes of summer lightning which played about the brows of Caucasus, as though the mountains held hidden volcanoes in their arms. The distance between the lonely little stations grew greater and greater; in some cases it was as much as 18 miles. The only sound which broke the stillness of the steppes was the occasional chirping of a cricket. The temperature rose to over 80° Fahr. during the day, a sure indication that we were approaching more southerly climes; but as yet the nights were still balmy and beautiful.

Petrovsk, on the Caspian, a humdrum little place, offering nothing of interest, has scarcely grown at all since the railway was built from Beslan, although the new route is the shortest way to Transcaspia and West Turkestan, and obviates the necessity of crossing over the Caucasus, in this having the advantage over the route *viâ* Baku and the Georgian military railway. There is not one building of importance in the little town; the only features it possesses are the church, the barracks, the railway station, one hotel, a Tatar mosque, and a watch-tower for fires. The country around is sadly lacking in vegetation. Greyness and barrenness are its predominant traits, and the hills which encircle it are equally bare and sterile. True, there is a public park inside the town, besides a few scattered groups of trees; but the place is very exposed, utterly without shade against the sun as without shelter against the storms which beat in off the Caspian. Some few years ago Petrovsk was a sort of holiday resort and bathing-place, to which the people of Baku were accustomed to run over in the summer. But during the last eighteen or twenty years the town has been haunted

by a malignant fever, and as a consequence of this many of its former inhabitants have left and gone elsewhere to live. The harbour is but a poor affair, consisting of little better than an artificial pier, or rather of two pier arms which, like a crab's claws, embrace a small basin, where vessels are loaded and unloaded by a crowd of sunburnt, bare-footed Tatars, dingy with dirt.

It was five o'clock on the afternoon of 5th July when the *Tzezarevitch Alexander* started for Krasnovodsk, a journey which takes on the average about 32 hours. We were not long in steaming out of sight of the coast and its low hills. Under the impulse of a fresh south-east wind the sea ran high, and the paddles laboured hard, especially during the night when the wind blew strongest. There were only a very few first-class passengers on board, mostly Russian officers serving in Asiatic Russia, some with, others without, their families. But the fore-deck was crowded with Asiatics—Sarts, Tatars and Armenians. Right out in the open the water was a transparent bluish-green, and the crests of the waves were tipped with foam. But throughout the whole of the passage we did not catch a single glimpse of either sail or steamboat. As we approached the Asiatic coast the wind gradually dropped and the sea grew smoother, and early on the morning of the 7th July we sighted the hills and promontory of Krasnovodsk. But before we could make the port, we had to luff to the south to get round a long and narrow peninsula which protects the bay on the west. The sea shallows a long way out from land; the lead had been going all the afternoon.

Krasnovodsk is one of the wretchedest places under the sun. It possesses not a single tree, is totally destitute of other vegetation, and has no drinking water, for the water in the wells is as salt as the water of the sea itself. Every drop of water has to be fetched from further inland in big wooden casks fastened on waggons specially made for the purpose. The white, one-storied houses, with their flat roofs, are fully exposed to the noontide sun. I could not help pitying the poor Russians who are condemned to serve in such a parched and dreary hole.

In the middle of the day the thermometer rose to 98°.5 Fahr. in the shade, nor was the burning dryness of the atmosphere in any degree tempered by the proximity to the sea. When I visited West Turkestan in 1891 the Transcaspian Railway

started from Uzun-ada. But in consequence of a destructive earthquake, which visited that town in the year following, when the earth rose and fell like the waves of the sea, and the rails were so twisted and bent that every bolt and nut in them started, Krasnovodsk was again made the terminus in 1893.

General Kuropatkin had done me the great kindness of telegraphing to Krasnovodsk, ordering the railway authorities to give me a whole carriage to myself all the way through to Andijan. After stowing away all my baggage, I still had room to arrange myself as comfortably as if I had been in an hotel. I had a writing-table, chairs, and lounges; and as mine was the last carriage on the train, I had a free and uninterrupted view of the country from the back of it. The keys of the carriage were in my possession, and I was completely isolated from all the other passengers in the train. This was a great advantage during the hot days of that desert journey. I could dress as scantily as I pleased, and every now and then go into my sleeping compartment and refresh myself with a *douche*.

We left the Caspian at five o'clock in the afternoon, and after skirting for three hours the shore of the Balkan Gulf, we turned eastwards and plunged into the desert. At midnight the thermometer dropped to 82°.5, and my energies, which had become torpid in the torrid heat of the day, once more revived. Early on the morning of the 8th we reached Kizil-Arvat, and at two in the afternoon Askabad. The station master of the latter place was Colonel Svinhufvud, a bright and congenial Finn, whose acquaintance I made on my first journey in these parts.

My meeting with him was marked by the following characteristic incident. I asked him to give orders to uncouple my carriage at Merv and hang it on to the first train that ran down to Kushk. For, whilst studying the Russian railway time-table, it had occurred to me, why should I not run down and have a peep at the much-talked-of fortress of Kushk and the region towards Herat? My ticket said in plain and unmistakable language, that "Dr. Sven Hedin was to be granted free passage for himself and his belongings over all the Imperial Russian railways, both in Europe and Asia."

But Colonel Svinhufvud smiled significantly, and taking out his pocket-book, drew forth a telegram from the Minister of War, which he read to me. "In case Dr. Sven Hedin should

contemplate going to Kushk, please inform him that that line is closed to all travellers."

That was explicit. However, I thought to myself that the Russian military authorities did quite right to keep jealous watch upon a place of such great strategic importance as Kushk. I was told that the line was even closed to ordinary Russians, and that nobody was allowed to travel by it except those who formed the garrison of Kushk.

That same afternoon we passed Kahka, the place where I struck the line in 1890, when I rode over from Meshhed *viâ* Kelat-i-Nadiri. All these places are typical oases strung along the southern edge of the Kara-kum Desert, and are watered by intermittent streams that flow down from the barren, greyish-brown, weathered slopes of Kopet Dagh on the frontier of Persia. To the north of the line the country was a good deal more uniform. Strips of steppe alternated with patches of sandy desert, what little vegetation there was was burnt up by the sun, the heated atmosphere pulsed in liquid waves along the tops of the sand-hills, and every now and again the eye was cheated by a mirage, which generally took the form of a pleasant grove of trees standing on the shore of a tranquil summer sea. Shortly after noon the thermometer rose to 106°.2 Fahr. in the shade. When I put my head out of the carriage window I could, it is true, feel a distinct breeze, but it was burning hot, like the heat-waves which radiate from a baker's oven.

We reached Merv at 2.30 a.m. on the morning of the 9th July. Then, after crossing another division of the Kara-kum, we came at midday to the large and flourishing oasis of Chardjui, where the arrival of our train in the bustling station was evidently the chief event of the day.

Just beyond the station of Amu-daria we slowed down whilst crossing the strong wooden bridge * which there spans the Amu-daria. It took us 26 minutes to get across. As the river was just then at its highest, it was like riding across a vast lake. Although a tremendous volume of water, brown as *café au lait*, rolled on underneath the bridge in one solid mass, it was easy to see that it was compounded of different currents; and the main stream was accompanied on each side by minor currents. Both above and below the bridge the river seemed to have no termination. Its bosom was strewn with drift-wood and snags,

* When I returned home in the summer of 1902 this was replaced by a new iron bridge.

and the water flowed absolutely without noise, except for a little gurgling against the piles which supported the bridge.

After crossing another dreary belt of desert, in which the sand-hills were over 30 feet high, we arrived at New Bokhara, a place which did not exist when I visited this region before, but now it bids fair to become a thoroughly Russian town. The Emir, the descendant of the Great Tamerlane, has built a palace there, in the Russian style of architecture. Between Bokhara and Samarkand I had the rare pleasure of travelling with my old friend and countryman Dr. Fegræus, who holds the appointment of geologist at the Nobel Works in Balakhani and Baku. I was quite sorry to part from him at Samarcand, whither he was journeying. We sat and talked in my saloon carriage the whole night long; and after the thermometer dropped to 77°, we felt it quite a refreshing change after the 105°.8 of the day. We chatted in Swedish, toasted our absent friends in wine from Tashkend, puffed away at our pipes, and discussed old times in Stockholm and Upsala.

I left Samarkand and its luxuriant vicinity on the morning of 10th July. The river Serafshan (Zarafshan) is now crossed by a new bridge flung over beside the picturesque ruins of the old one, and beyond it the train runs through deep cuttings in the loess; it was as if we were travelling through a dry ravine or earthen avenue. On the other side of Jizak the railway traverses a monotonous, level steppe. The new stations along this part of the line are named after Russian generals who have distinguished themselves in that part of Asia, *e.g.*, Chernyayeva, Vrevskaia, and so on. Finally, after rolling across the Syr-daria on a good iron bridge, the train steamed into the large and bustling station of Tashkend, the capital of West Turkestan. The importance of this place will undoubtedly increase when the new line is opened, about the end of 1903, from Orenburg.

In Tashkend I stopped to visit His Excellency the Governor-General of Turkestan, S. M. Dukhavskoi (who shortly afterwards was carried off by death), as well as my old friends of the Pamir Boundary Commission, Colonel Salessky and M. Bendersky, the topographer. I also took the opportunity to have my chronometers regulated at the observatory. On the evening of the 12th I continued my journey, returning first to Chernyayeva, where I had to wait the greater part of a day for the train from Samarkand. Fortunately there was a large tent close to the station, with a bath inside, which affords passengers some measure of relief

from the noonday heat. We started again at five p.m.; but it was not until three hours later that we began to feel any sensible abatement of the heat of the day. And I need hardly say that our heartiest blessings accompanied the sun when he disappeared in the west.

After that the train traversed the fertile valley of Ferghana, threading its way amongst gardens and orchards, villages, cultivated fields, and grassy steppes, with first the Turkestan moun-

Islam Bai.

tains, and after them the snow-capped peaks of the Alai Mountains framing in the valley on the south. Every now and again we ran alongside the Syr-daria. At various places, beside the villages and at the points where the roads crossed the railway, we saw groups of Sarts. They have not yet grown accustomed to the wonderful "machine" which flies past at such a marvellous rate on the *temir-yoll* (iron road). At nine in the evening we reached Andishan (or Andijan), the terminus of the Russian Central Asiatic Railway.

As the train slowed down to the platform, I saw standing

waiting for me, as calm and steadfast as when I last parted from him, my faithful old servant Islam Bai. He was dressed in a blue *khalat* (Kirghiz coat) and wore on his breast the gold medal which King Oscar gave him. He was just the same, looked vigorous and hardy, but had aged a little, and his beard was greyer. He said himself, he was now an old man. I greeted him warmly, had him up into my carriage, and there we sat and talked for three hours on end, partly about his long, four months' journey home from Urga in Mongolia in 1897, and partly about the journey I was just beginning. Islam grasped my plans at once, and entered into them with the greatest interest. And as I stood and watched him setting out for Osh, with all my baggage loaded upon *arabas* (Turkestan carts), I felt glad I had such a faithful fellow to entrust it to. From that moment onwards he again officiated as my *karavan-bashi* (chief or captain of the caravan), and attended to all my wants, anticipated my wishes and procured everything that was required for the equipment and furnishing of my successive caravans. Poor Islam Bai! Alas! that the journey which thus began for him in the rosiest colours should close in such an unhappy, such a pitiable fashion!

CHAPTER II.

OVER THE PASSES TO KASHGAR.

At Osh I spent two very pleasant weeks in the company of my excellent friend, Colonel Saitseff, of the Pamir Boundary Commission, and his amiable family. He held the appointment of *uyäsdny natyalnik* (district commissioner) of the district of Osh, ruling over a population of some 175,000, of whom 35,000, all Sarts, together with 150 Russians and a garrison of 800, were concentrated in the chief town. The commissioner's residence stands in the midst of a park, buried in luxuriant vegetation, on the right bank of the Akbura, and commands a magnificent view down the valley. My stay in Osh was, however, somewhat marred by a violent inflammation of the eyes. This trouble tried my patience severely; though after all I did not really lose much through the involuntary detention, for Islam Bai was all the time busy organising the caravan and getting it ready to start, engaging servants, seeing after two tents being made, and laying in the requisite stores, such as sugar, tea, stearine candles, petroleum, leather trunks, saddles, and so forth. I and Colonel Saitseff went one day to see Islam in his own home in the Sart quarter. He lived in a poor and simple hut of clay, standing in a little plot of ground which he owned, and had a wife and five children. I left with them presents in money and other things, by way of comforting them for the approaching absence of their prop and stay. During my previous journey I paid Islam 25 roubles (about £2 13s.) per month; now I increased this to 40 roubles (£4 4s. 7d.), a large salary for an Asiatic, especially as Islam had rations and everything else free. I deposited his first year's salary with Colonel Saitseff, who agreed to pay over to his family 10 roubles every month.

As soon as my eyes were better, and everything was ready, I resolved to make a start. Accordingly the caravan set off early on the morning of the 31st July, and went as far as Madi.

Kader Ahun, Islam Bai, and Musa at Nagara-challdi.

Meanwhile, after a festive dinner, with giving of toasts and drinking of champagne, at Colonel Saitseff's house, I quitted Osh in the afternoon, escorted on the way by my host and his wife, and by a small cavalcade of young ladies and Russian officers. At Madi we found one of my tents set up in a grove of trees, while the *min-bashi* (chief) of the district had furnished a large *yurt* (Kirghiz tent) with chairs and tables. These last groaned under a plenteous *dastarkhan* (repast), consisting of such luxuries as *ash* (rice pudding), chickens, sweetmeats, tea, etc. At dusk my friends rode back to Osh, and I was finally cut off from civilisation; and when at nine o'clock that same evening I took my first series of meteorological observations, I felt I was once more "on the travel," and my thoughts flew back to the "thousand and one" nights I had spent, only a few years before, under similar conditions, in the heart of the great and desolate continent of Asia. It was delightful to be once more "tented" in the open air, with the boundless expanses of the vast continent before me, and a multitude of new hopes and new projects began to swarm through my brain.

Islam had procured for me two fine pups. One of them, a setter, was called Dovlet; the other, a creature of mixed Asiatic blood, was named Yolldash. I had them tethered to my tent, so as to train them to be its watchful guardians, and they were not many days before they learned what was expected of them. I grew so fond of these two beasts, that when I subsequently lost them, I missed them terribly.

The *personnel* of my caravan consisted of Islam Bai, its leader, of Kader Ahun and Musa, two *jighits* (couriers) of Osh, each engaged permanently for 15 roubles a month, and of four *karakesh* (horse-owners), who accompanied the 26 horses which I hired, at the rate of eight roubles a head, for the whole of the journey to Kashgar, a distance of 270 miles. These men had two tents for their own use, and around them the baggage was stacked up like bastions, making quite an interesting scene on the outskirts of the town. At first, and for as far as the new-made driving road extended, I preferred to travel on wheels.

Our real start was made on the morning of 1st August, but the day was already wearing on when we at length got on the move. The weighing and dividing of the baggage, so that the two cases which were slung one on each side of a packhorse should balance evenly and be of the same weight, naturally took up a good deal of time.

My stately caravan of 26 horses, with its mounted captain at its head, presented a truly stirring sight as it filed out into the uncultivated country beyond the little village. The landscape was at first open and bare, but soon grew more diversified and in part covered with yellow grass. Then the hills gradually closed in on both sides, until they finally formed a typical valley. The "going" was first-rate, but the heat was scorching—a remarkable contrast to Osh, with its orchards and plentiful supplies of water. We came upon the *auls* of the Kirghiz immediately outside of Madi. These tented villages, with the big flocks and herds of sheep, goats, cattle, camels, and horses grazing around them, quite brightened up the landscape. The Kirghiz of Ferghana spend the summer up amongst the mountains and in the valley of the Alai. The most conspicuous feature of their nomad life is the women, with their red garments, their ornaments, and high white head-gear.

The next day we crossed over the little pass of Chigherchigh, climbing up to it by a gently sloping valley of red and yellow clay, moderately clothed with fine grass, on which the Kirghiz were grazing their flocks. Two Kirghiz horsemen, catching up the long ropes which hung from the carriage-pole in front of my horses, set off up the pass at full gallop. But over on the other side the slope was much steeper, and the road zigzagged every few yards, so that I had to keep the brake jammed hard against the back wheel to prevent the phaeton from going faster than might have been agreeable, or even safe. The Ileh-su, the little brook which trickled down the eastern face of the pass into the Gulcha river, rippled merrily amongst the stones and bushes with which it was fringed, and often broke into creamy cascades. After a little the steep descent came to an end, the valley opened out, and before us lay, embosomed amid slender poplars, the little town of Gulcha, with its half-dozen Russian houses, its barracks, telegraph station (the last that the Russians have in this direction), bazaar, and fort garrisoned by a *sotnia* (company) of Cossacks. Gulcha stands on the right bank of the Kurshab or Gulcha-daria, which carried a considerable volume of water, notwithstanding that it was only $2\frac{3}{4}$ ft. deep—deep enough, however, to enter the bottom of my carriage when I crossed it.

The road from Gulcha kept to the right bank of the river, which flowed along a broad and stony bed, though in several arms. But the previous winter's fall of snow having been in-

considerable, the volume was less than usual. The road, notwithstanding that it ran up and down over the hills and ridges, was first-rate. It is maintained with great care, and is repaired every spring, for it is generally destroyed by avalanches and melting snow, especially on the passes. The bridges which spanned the river were made of wood, cleverly strengthened with upper beams, and were thrown across at places where one span would easily reach from bank to bank. What a contrast to the wretched, swaying contrivances of the Kirghiz

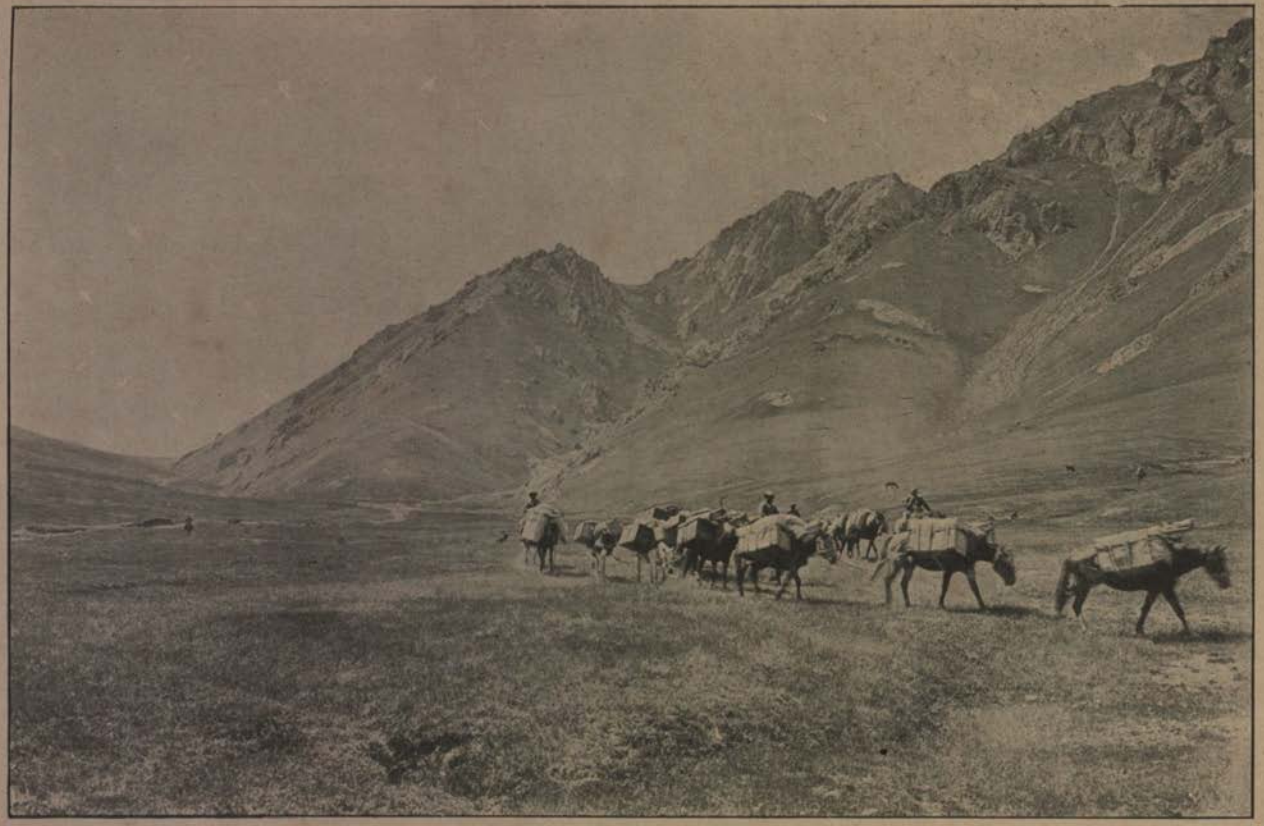
A Bridge above Gulcha.

which I saw on the occasion of my first visit nine years before! But since then the road itself has acquired strategic importance, in that it is now continued up the Alai valley to Bordoba (Bortteppeh), and then on further *viâ* Kizil-art and Ak-baital to Fort Pamir. You can now drive the whole of the way from Osh, and the Russian outpost on the Murghab is supplied with provisions and building materials by cart. Artillery also can now cross the desolate plateaus of the Pamir. At several points along the route, *e.g.*, at Bordoba and at Kara-kul, the Russians have built station-houses of stone, well masked with earth, so that they merely look like hills or mounds, and might easily be passed without observation by anybody unacquainted with their position. Each of these rest-houses contains a room with fire-places, store of provisions, samovars, and so forth, and is

intended to afford shelter to travellers and couriers (*jighits*) during the winter, when the snowstorms rage.

The higher we ascended the more distinctly the river became concentrated into one well-defined channel, as well as shut in on both sides by steep crags. We had already passed a few isolated poplars (*terek*); now junipers (*archa*) began to make their appearance, scattered along the mountain sides. Partridges were very plentiful, and not at all shy. At the little clay fort of Kizil-kurgan (red fort) some Kirghiz were awaiting me with tea. A little further on I pulled up under the shade of a grove of fine poplars to wait for the caravan, and fell asleep, and slept as I had not slept for many a long day. And I was really in need of it, for I had rested very badly during the first nights of the journey, through not being yet accustomed to the restless life of the caravan, especially the noises of the camp, such as the neighing of the horses and the barking of the dogs. But I had barely slept an hour when I was awakened by shouts and whistlings, and my caravan defiled past me. At its head rode one of the men on an ass, leading the three horses which carried my cases of valuable instruments. The rest of the caravan was divided into three sections, each in charge of one man, whilst others of the men walked beside the horses to adjust the loads when they slipped or no longer rode well and evenly. Last of all came Kader Ahun, leading in a string a new dog I had bought. The shrill echoes of the horses' bells made very pleasant music in the pass. Slowly the long string of animals filed on past me, disappeared in a dip of the road, emerged into view again, once more vanished, and yet once again appeared in sight, slowly climbing a steep acclivity. But I was not long in catching them up, in a part of the valley where the road ran as it were along a shelf, protected by a parapet, high up above the river, which was there spanned by several bridges.

After traversing a glen dotted with poplars, and called Kirgaul, the road grew more stony, and for long distances ran along the shoulders of perpendicular screes and gravelly slopes, the bases of which were washed by the stream. An affluent, which emerged from a *yilga* (glen) called Billauli, contributed pretty nearly one-half of the volume of water in the main river. At the entrance to every side-glen we obtained picturesque glimpses into the heart of the mountains. Poplars became more and more common and the bushes more plentiful; the path ascended



My First Caravan.

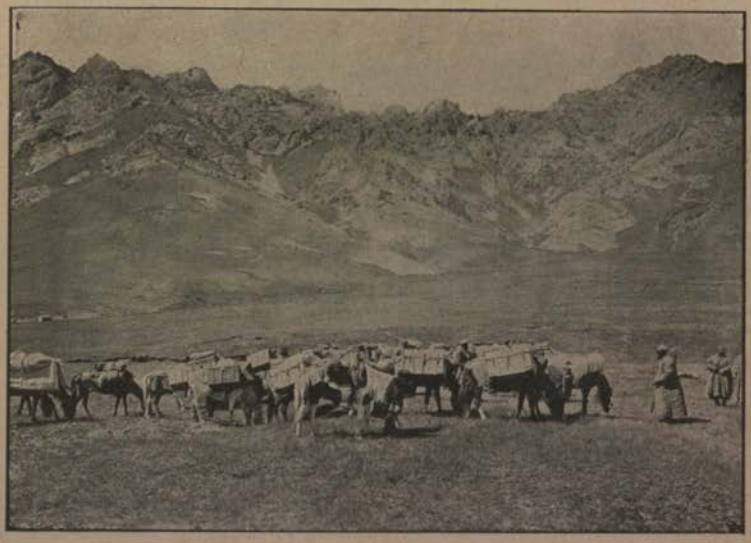
somewhat, cascades increased in frequency, and the ripple of the stream waxed louder and louder. In a particularly inviting poplar grove on the right bank of the river, in an expansion of the valley known as Kulenkeh-tokai, we granted ourselves our first day's rest. It was indeed an ideal place to rest in, being so still and quiet, for the horses were sent off to graze on certain *yeylaus* (summer pastures) in the neighbourhood. The sky was overcast, the air pleasant, and at intervals there was a drizzling rain, through which the sun peeped out occasionally. It blew alternately up the valley and down the valley, and the sound of the wind among the leafy trees was like a consecration hymn. I lay and listened to that old familiar murmur, and dreamed myself back among the crowds of incidents which made up my former journeys, and my imagination reached out towards the coming years and the vicissitudes—disappointments and losses, successes and discoveries—which they had in store for me. Although I was not yet fully habituated to the loneliness of caravan life, I was sufficiently impressed by the difference between my present occupation and those of the past two years. The melancholy crooning of the poplars and the increasing murmur of the river alike seemed to bid me exercise that patience which is the surest guarantee of future success. The camp seemed silent and deserted, no curling smoke betrayed the presence of a fire, and there was not a human being within sight, for my men were all fast asleep inside their tents. Nothing broke the solemn stillness save the ripple of the water and the stirring of the wind in the tree-tops.

Shortly after midnight we were treated to a copious downpour of rain, which pattered briskly on the tent-canvas. It was quite cheering and refreshing to hear it after the oppressive heat of Turkestan; indeed, on towards morning the air felt decidedly cool. This unexpected shower woke up the camp, and my men rushed out to drag the packing cases and baggage under cover.

Shortly after striking camp on the following morning we crossed the river two or three times, but after that kept for the most part to the right bank. At Sufi-kurgan we passed on the left hand the glen of the Terek, which leads up over the pass of Terek-davan by a shorter, but more difficult, route to Kashgar. Above that point the main stream diminished in volume, but the valley itself widened out again, and its grey, regularly-sloping bottom contrasted strikingly against the terraces of red

sand, gravel-and-shingle, and common clay which walled in the river steeply on both sides. We pitched our camp in the open valley of Bosuga, where pasture was plentiful and Kirghiz *auls* were numerous, while the mountain slopes all around were clothed with junipers, in some places standing so thickly together as to form forests. On this, as on the preceding day, we marched 26 miles; the *verst* posts still lined the side of the road.

My pups Dovlet and Yolldash were perfectly killing. They were only a couple of months old, and unable to run very far;



A Short Rest by the Way.

so I packed them into a basket, fastened at the back of the carriage. At first they were so amazed at this strange manner of travelling that they were unable to utter a sound. However they soon grew accustomed to it, and Dovlet, who was luxuriously inclined, used to keep a sharp eye upon Yolldash, and if he refused to let him have the softest place to lie in, used to give him such a lesson that the poor beggar whined most pitifully. But upon being let out of their prison when we pitched camp, their joy was unbounded, and they became the very best of friends, and frisked and raced, and tumbled over one another, as though there had never been any differences at all between them. By this time they were quite at home in the camp, and at night always slept beside my bed.

And first-rate watch dogs they proved, for at the least suspicious sound they barked furiously. They always had their meals with me, but oh! what appetites they had!

The night of the 6th August was decidedly cold; the thermometer fell nearly two degrees below zero (Fahr.), and I had to unpack my furs, felts, and winter cap. The rarefaction of the air did not, however, occasion me the least inconvenience, although the loss of breath which followed upon any strenuous exertion proved that we were subject to what the natives call *tutek*, or the feeling that is experienced when crossing a lofty pass.

The road continued upwards beside the Talldik rivulet, and sometimes even ran down into the bed of the torrent,* but eventually it quitted it and wound up the mountain slope. After passing more side-glens, two or three of which led up to the pass over the Alai Mountains, we came to the foot of the real ascent. This was neither excessively steep nor dangerous, for the road has been made to climb up by innumerable short zig-zags, each protected by a parapet. The rock through which it has been cut is a black, much-folded slate. On the summit of the pass of Talldik, within an inclosed area, there stands a post, to which are attached two cast iron plates, proclaiming that the pass is 11,500 feet high, and 58 miles from Gulcha, and that the road was made when A. B. Vrevsky was Governor-General of Turkestan and N. J. Korolkoff was Governor. The work was begun on 24th April and finished on 1st July, 1893, under the superintendence of Major Grombtshevsky. On the other side of the pass, that is, going down into the Alai valley, the descent was not so steep, and it needed but a very few turns to bring us down to the stream which led to Sarik-tash. But on that side of the pass there was not a single juniper; the slopes above the Alai valley were entirely destitute of timber.

At Upper Sarik-tash I dismissed my *arabachi* (coachman), giving him a good tip and a dagger, for he had driven me capitally, and without a single mishap to horse or vehicle, all the way from Osh. Henceforward I travelled on horseback, and to begin with tried a new Hungarian saddle from Budapest. We were not long in coming to Sarik-tash, properly so called, where the glen from the pass of Talldik led down into the Alai valley. After that we turned to the east, leaving the last verst-posts of the Russian road behind us. To the south we now had

the magnificent mountain system of the Trans-Alai, each mountain giant clad in a pure vesture of snow, softly tinted with light blue, while most of the loftiest summits were wreathed in clouds. These were particularly numerous towards the west, and consequently we were unable to see Peak Kaufmann. Directly opposite to us when we came out into the Alai valley was the glen of Kizil-art, up which ran the road from Bordoba to the pass that I crossed on my former journey (1894). Looking westwards we had an unlimited view down between the two huge mountain-ranges of the Alai and the Trans-Alai, the valley between them being broad and open, and abounding in

A Camel Caravan Fording an Arm of the Kizil-su.

pasture, as might readily be inferred from the great number of large *aghils* (sheep folds) and the immense flocks of sheep which dotted the mountain-sides in many places. The Kirghiz horsemen who met our cavalcade invariably dismounted and greeted us on foot.

At its eastern end the Alai valley is shut in by a ring of mountains, nicked however by the flat pass of Tong-burun, which forms at one and the same time the eastern threshold of the valley and the main watershed in that part of the world. At intervals we crossed over low spurs of the Alai, *e.g.*, Katta-sarik-tash, all stretching towards the south, that is towards the middle of the valley. Gradually all the rivulets and tor-

Nagara-challdi.

rents which coursed down these stony side-glens became united into one stream, the Kizil-su, the main artery of the Alai valley.

During the greater part of the day it hailed, and sometimes rained, although the fall was slight; but as we drew near to our camping-ground at Äylämä, the weather grew much worse and the rain came on faster. Hardly was the tent up, when down upon us burst the storm, but fortunately we all got safely under shelter without being drenched. August though it was, the weather was quite autumnal, and the air raw and cold, and heavy clouds hung about the mountains. As this place was said to offer the best grazing all the way to Kashgar, we resolved to give the horses a day's rest. All along we were escorted by Kirghiz horsemen, who kept us supplied with fuel; and besides having a yurt always ready for us, they fetched us mutton and milk from the nearest auls. This second day's rest was no better than the first; it literally poured with rain. Autumn had, it was evident, already begun amongst these mountains of Ferghana. But we comforted ourselves with the reflection that in such weather it was more comfortable to be snug and dry inside a good roof than to be getting wet through in the saddle.

The next day, the 9th of August, was a splendid day, with a bright blue sky; and we climbed slowly up towards the pass of Tong-burun, or rather it is a broad *bel* (saddle), which the Kirghiz hardly deem entitled to the name of a pass. All the same, the little cairn, which stood on its softly rounded, convex summit, marked a very important geographical fact, namely, that here we had the watershed between the drainage basins of the Sea of Aral and Lop-nor. Hence it was a more important dividing line than Talldik itself, which merely separated the basin of the Syr-daria from that of the Amu-daria. From this watershed the contour sloped all the way to Lop-nor.

After riding a short distance up the glen of Shura on our right, we climbed the steep slope which overhung it. It was a tough pull for the horses; some of the loads slipped, and occasioned delay. We were now quite close to the mountains that formed the eastward continuation of the Trans-Alai; but they were muffled in snow, and had their summits shrouded in clouds.

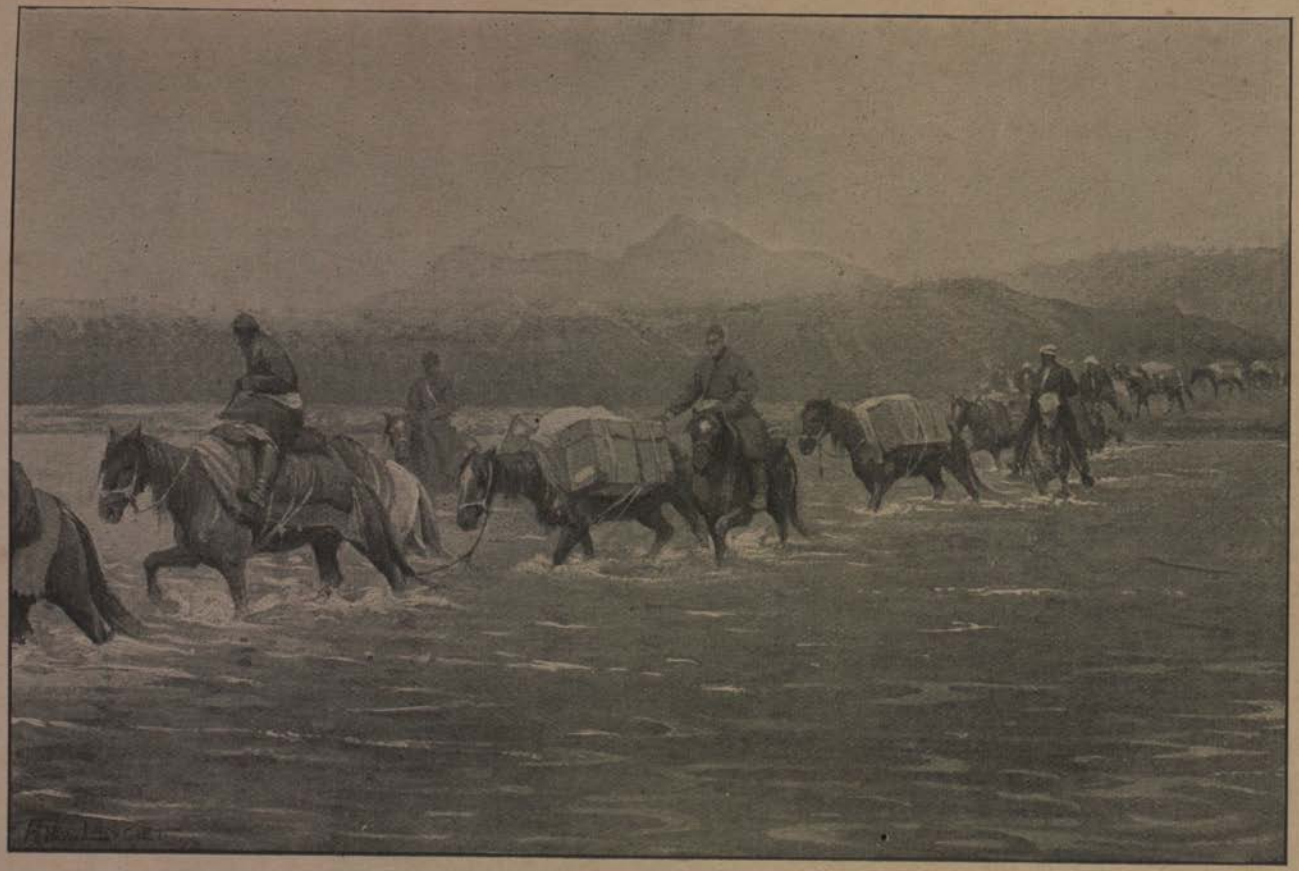
After that we travelled along a sort of flattened ridge, leaving the Kizil-su (of Kashgar) on our right, and eventually dipped down into the depression of Kho-yilga. This last possessed no definitive drainage channel, but had a large number of peculiar pits or cavities of great size, into which the rain water gathered;

at least it would appear so from the horizontal deposits of mud which covered them at the bottom. In some of the crevices small junipers had taken root, and the region abounded in bobacs or steppe marmots (*Arctomys Bobac*).

Next we descended a steep gravelly slope or terrace until we came to the confluence of the Kizil-su and the Kok-su; and then continued over crests and along terraces zigzagging over broken ground and across more or less deep ravines. As we advanced the vegetation grew scantier and scantier, and the junipers stood further and further apart.

The next important feature we encountered was the broad valley of the Nura, furrowed at the bottom by its deep and strongly scarped river-bed. The Nura was a more considerable stream than the Kizil-su, and its water just as red as that of the Red River (Kizil-su) itself. It was anything but an agreeable stream to ford, for the treacherous stones which littered it were invisible owing to the muddiness of the water, and sometimes came within an ace of bringing our horses to their knees. Had we been a month later the river would have been in full flood, and we should have been unable to cross it at all; as it was, our travelling cases were in considerable danger. Fortunately the river was lower than usual owing to the dull, cold weather of the past few days. It is astonishing what a difference two or three days of bright, warm sunshine make in the volume of a stream like this. After their confluence, the united Nura and Kizil-su formed quite a respectable stream.

Our route lay along the slopes which overhung the right bank of the river, the path climbing and dipping incessantly, until at the top of the last pass we beheld, far down below us, the white walls and towers of the Russian frontier post of Irkeshtam, which is held by a Cossack garrison. Irkeshtam is a customs station as well as a frontier blockhouse, and in the chief customs' officer there, M. Sagen, I found again an old acquaintance, whom I had met on a former visit to Kashgar. This gentleman was a great lover of animals, and had a private menagerie, consisting of a wolf, some foxes, and a bear, the last tethered beside his den in the middle of the courtyard. Some time after my visit Bruin, who was completely untamed, contrived to wriggle himself loose from his chain, and went and paid his respects in the couriers' room, to their no little consternation. But Master Bruin's adventure had for him a tragic termination, for the men took refuge on the roof, and from



Crossing the Kizil-su on the Way to Kashgar.

that point of vantage bombarded the poor beast till they killed him.

Half an hour's ride beyond Irkeshtam we struck the Red River again; by this it had swollen into a turbulent torrent of muddy water, 2 ft. 7½ in. deep and with a temperature of 9°.9 C. or 49°.8 Fahr. We were now within the confines of the Celestial Kingdom, which stretched hence eastwards all the way to the Pacific. The road led along the left side of the Kizil-su, and then through a narrow gorge up to the pass of Torpag-bel. After that we crossed the barren, sandy, gravelly steppe of Däsht, diversified by sparse tufts of grass and numerous water-channels, all now dry; indeed the entire landscape, which was shut in on every side by mountains, wore an altogether arid appearance. The outliers of the Pamirs, amongst which we were now travelling, were everywhere diminishing in elevation, until finally they ended in low hills and ridges of gravel-and-shingle, seamed by trenches, gulleys, and erosive furrows. Nevertheless the hard rock, a black slate, cropped out almost everywhere.

Thence crossing over the little pass of Kara-davan, we reached, at first by a steep descent, but afterwards by easier slopes, the broad, open valley of Yeghin, at the bottom of which, on the left bank of the biggish stream which threaded it, stood a Chinese fort. There we found encamped a caravan of 150 camels bound for Kashgar. When they started again, about three o'clock in the afternoon, it was quite a sight to see the big, clumsy animals ploughing their way across the Kizil-su, churning up the water as if they were so many paddle-boats.

Our route led on down the valley, which gradually narrowed, while the river hugged closely the foot of the cliffs on the right. A thin belt of vegetation—poplars, willows, scrub and grass—accompanied each bank of the stream. Below the confluence of the Yeghin with the Kizil-su, the valley widened out again, so as to embrace within its precipitous rocky arms a beautiful little wood, traversed by a cheery rivulet. This region was known as Nagara-challdi, and was the queen of all the oases on the road to Kashgar.

We pitched our camp a couple of hundred yards below the confluence of the Nagara-challdi with the Kizil-su. Here on 11th August, which again was set aside for a day of rest, I measured the volume of the latter stream: it amounted to 1,492 cubic feet in the second. Had a stream of that magnitude

been confined to one channel with a swift current, it would have been anything but easy to cross it; but fortunately for us it was divided amongst four shallow arms, so that we got the caravan over on the following morning without mishap. I was very pleased to find there was relatively so great a volume of water in the Kizil-su, for this stream was one of the main feeders of the Yarkand-daria, down which I hoped to float right away to the region of Lop-nor.

At first we rode along the right bank, passing on our left a blockhouse of clay, built by Yakub Beg of Kashgar. During the next few hours we forded the river no less than four times. At the first fording in the morning we found that the volume had increased over 700 feet cubic during the night, and it continued to increase at each successive crossing. In a large triangular expansion of the valley, at a spot where a little rivulet came down from the north through the glen of Ala-yukka, stood the square clay blockhouse of Ullug-tshat, the nearest stronghold to the Russian frontier which the Chinese maintain in this direction.

We crossed the Kizil-su for the last time in another similar triangular expansion of its valley called Semiz-khatun, where, amid poplars and bushy scrub, stood another little *kurgan* (fort). But this time the passage was nothing like so easy, for the current was there confined to one channel, and its volume had swollen so rapidly that it now measured 3,000 to 3,500 cubic feet in the second. The muddy reddish current rolled on with a sullen, scowling face, underneath which lurked many deep and treacherous pits.

Islam Bai rode into the river to see what the ford was like, but all at once he plumped into deep water and got a thorough ducking. Kader Ahun, who tried it in another place, fared even worse; for he stumbled into a regular trap-hole, his horse lost its footing, and the two together were whirled away by the current, each only just managing to keep his head above water. Kader usually carried my kodak, but luckily he had handed it over to me immediately before going into the river. After that one of the karakeshes stripped to the skin and mounted bare-back, and by dint of letting his horse go where he liked, managed at last to find a firm ledge, which ran diagonally across the stream as far as a little tongue of gravel, and thence turned back again up-stream. The other men followed their comrade's example, and having stripped led the caravan animals across

Camel Caravan on the Way from Osh to Kashgar.

in small detachments, first the three horses which carried our supply of food, then the tent, the tinned goods and other baggage, and last of all the horses which bore my instruments and photographic outfit, each animal being convoyed across singly by the three men, who were ready to come instantly to the rescue should the animal stumble or fall. It was impossible to sit and watch without a feeling of great anxiety the heavily-laden horses struggling against the fierce energy of the current, for the ledge I have mentioned ran for the greater part of the way

Fording the Kizil-su.

up-stream, so that the water broke like a cataract against the horses' chests.

Luckily we all got over without mishap, for the packages that were likely to suffer from wetting were tied up higher before the horses entered the river. Then, after readjusting the loads, and drying ourselves a little, we continued our way, and pitched camp for the day at Yaz-kitchik, beside a Kirghiz aul or tent-village. Here we said good-bye to the Kizil-su, which flowed away to the south.

It was a cool and beautiful evening, with a bright moon and glittering stars, and through the stillness of the night there echoed from afar the dull jingling of the camels' bells from the big caravan travelling to Kashgar. The sound roused our dogs to frenzy ; nevertheless the low but solemn rhythm had for

me a great charm ; it was eminently symbolical of the calm, majestic gait of the lordly camel. Gradually the echoes came nearer and nearer, we heard the shouts and singing of the camel-drivers more and more distinctly. Then they went on past us in the darkness of the night, filling the air with a tumult of noise and confusion. And finally the riot died away amongst the mountains.

The last few days' march ran through a perfectly mono-

M. Nicolai Fedorovitch Petrovsky, Privy Councillor and Russian Consul-General in Kashgar.

tonous region—barren and destitute of vegetation—while the hills drooped and drooped until finally they ended in level plains.

On the 13th August we crossed over the Mäshrab-davan, the summit of the pass being marked by a little fort and three *masars* or burial-cairns, hung about with rags. The following day's march took us through a deep, narrow glen, almost absolutely sterile, and shut in on both sides by the familiar folded red sandstone, the layers of which varied greatly in hardness and consistency, the hardest frequently jutting out in

overhanging friezes and laminated cornices. The ground under our feet consisted of the same sort of materials. Before we got to the *serai* or shelter-house of Kan-jugan we were caught by a rain storm of unexampled violence, and had to run up the tents in a great hurry. But it was of no avail; we all got wet to the skin. The water stood on the ground and splashed up at every footstep we took; and inside the tent, amongst the dripping cases, the air was cold and damp, and I was not sorry to put on my furs. A temperature of 12°.6 C. or 54°.7 Fahr. at 5.30 p.m. was quite an unusual thing at that season of the year in those localities.

On the 15th August we travelled to Min-yoll, and on the 16th made our last day's march into Kashgar, after being met at Kalta by Consul-General Petrovsky, Mr. George Macartney, and some Russian gentlemen then living in the capital of East Turkestan, followed by an escort of Cossacks.

CHAPTER III.

FROM KASHGAR TO THE YARKAND-DARIA.

I REMAINED in Kashgar from the 17th August to the 5th September, organising and equipping the caravan I was to lead into the deserts of innermost Asia. I need not say how hospitably I was entertained by my good old friend Consul-General Petrovsky, and how he helped me, as he had so often done before, in every possible way. He placed his ripe and valuable experience absolutely at my disposal, as also the well-nigh omnipotent influence which he enjoys in East Turkestan. Indeed but for his invaluable assistance many of my plans would have been altogether impracticable; but with it they turned out eminently successful. The first business we took in hand was to exchange my capital, amounting to some £1,200, into Chinese silver. At that time, in the bazaars of Kashgar, a yamba* was worth 71 roubles, (£7 10s.), but the market was so small that the purchase of 160 yambas all at once, sent the rate of exchange up to 72 roubles in the course of two or three days.

The business was arranged by a crafty old broker, Isa Hadji, and when the transaction was completed it appeared he had not fleeced us out of more than 36 roubles (£3 16s.). As it turned out, it proved an exceptionally good thing for me, because not long afterwards the yamba appreciated very suddenly and greatly in value; and yet the Volga-Kama

* One yamba=50 sär. One sär=16 tengeh=1·48 roubles=37 grams of silver=10 miskal=3 shillings. One tengeh=50 pul. One miskal=10 pung; 1 pung=10 li. The rate of exchange of Chinese silver is subject to great fluctuations. The yamba seldom weighs exactly 50 sär, but varies as a rule between 49 and 51; and as the monetary standard of Central Asia is the Chinese coinage, it is always necessary to have a Chinese balance at hand when exchanging money in any quantity. New silver coins, not exceeding a maximum value of 8 tengeh, have recently been introduced into East Turkestan. These are current along with the usual Chinese silver "shoes," an exceedingly inconvenient form of coined money.

Bank in Tashkend had generously (!) offered to sell me silver at the rate of 90 roubles the yamba. It is not the most convenient thing in the world to drag about with you a purse of money weighing 47 stone; but in this case I had no alternative. I distributed the money in the cases which would not require to be opened every day, and felt pretty well assured that I should not have it all stolen from me at once. However, before the journey was half over, my purse was empty, and I had to buy more silver later on, when the market actually did stand at 90 roubles the yamba.

Meanwhile, Islam Bai was busily engaged purchasing the necessary stores, such as additional supplies of stearine candles, matches and sugar, "Pamir tea"—this last was for the men's use—flour, macaroni and honey, besides saucepans and pots, copper teapots of Central Asian make, an oven, spades, soldering apparatus, ropes, various implements and tools, *e.g.*, axes, hammers, and nails, buckets, felt rugs and blankets, Chinese paper, washing soap, Sart trunks, and a variety of other things. Nor must I forget to mention a number of *khalats* or Kirghiz coats, rolls of cloth, handkerchiefs, and hats intended as presents to the native chiefs. In Upal, Islam bought, at the cost of £6 6s. a head, fourteen camels and a dromedary, all remarkably big, handsome animals. Yet, with the exception of two, they were all destined to perish during the journey; still the service they rendered me was worth many times what they cost. For each animal we had to pay to the Chinese authorities four shillings as a sort of market toll.

As leader of the camel caravan I appointed one Niaz Hadji, who, despite the sanctity arising from his pilgrimage to the Prophet's grave, turned out to be a thorough rascal. Amongst the other men whom I temporarily engaged I single out for mention only two. The first is Turdu Bai of Osh, a white-bearded old man, who in endurance was the equal of any young man I ever had in my employ, and in fidelity and efficiency was not surpassed by any Central Asiatic, not even by Islam Bai. This man was the only one who remained with me throughout the whole of my present travels. The other is Faisullah, a Russian subject like Turdu Bai, to whom he was little inferior in all the good qualities I have just enumerated; but he was unable to remain with me for more than a year and a half. Both men were expert in the management of camels, and consequently always formed part of the "staff" of the caravan.

I also took with me a Kashgar boy named Kader because of his knowledge of Arabic writing.

My first object was to get the whole of the caravan to Lailik on the Yarkand-daria. There I intended to divide my forces. While I, along with two or three of the men, and a very small portion of the baggage, floated down the Yarkand-daria or Tarim, the main body of the caravan would travel by the great caravan-road leading through Maral-bashi, Aksu, and Korla to some rendezvous in the Lop region; where, according to arrangement, I also expected to be joined by two Buriat Cossacks in the end of December.

The Two Cossacks—Sirkin and Chernoff.

Now Consul Petrovsky thought it would be very unwise to send such a big caravan, with such a large store of money, all through East Turkestan without protection, and offered to let me have two of the West Turkestan Cossacks of the consulate guard as escort, until I should be joined by the Buriats. It was a splendid idea, and I at once accepted the offer, with gratitude. The Governor-General of West Turkestan readily accorded his permission, and the two Cossacks were at once attached to my service. These men, Sirkin and Chernoff, proved first-rate servants, and rendered me invaluable help during the ensuing year; in fact, I never had better. The arrangement was that they were to continue to

A Rope-dancer in Kashgar.

receive their regular pay all the time they were in my service, but were to ride their own horses, and provide their own saddles, weapons, and ammunition.

I also arranged with M. Petrovsky, that any letters which arrived for me at Kashgar during the course of the autumn and winter were to be sent to the Lop country by four successive *jighits* or couriers. The days on which they were successively to start was definitely fixed before I left, so that I knew pretty well when each man ought to arrive. And as these couriers were not to be paid until they delivered my mail-bag, I felt

Market at Kashgar.

pretty easy with regard to that matter. The arrangement worked splendidly, for M. Petrovsky took it in hand himself. Thus I had the pleasure, of priceless worth to the solitary traveller, of getting news from home occasionally, and keeping in some fashion in touch with the great world.

The days passed swiftly amid the bustle of preparation, visiting and dining. Of the numerous friends whom I made during my former visits to Kashgar I saw a good deal; amongst others, of Mr. Macartney, the English political agent, whose home was now brightened by the presence of a charming wife. I also had the pleasure of meeting again my excellent old friend, Father Hendriks, as well as the Swedish missionary Mr. Högberg, and his wife, and the two new missionaries whom they had added to the station.

The Chinese officials, Khan Dao Tai and Tsen Daloi, were old acquaintances; but Tso Daloi, who had something to do with the police, was a new revelation. He appointed two *durgaz* (policemen), with instructions to see that the inhabitants of the city supplied the caravan with everything it needed—of course, in return for a handsome equivalent.

I was not, however, the only traveller who at this time happened to be present in the westernmost city of China; for on the 21st August, Colonel McSwiney arrived, the same member of the English Boundary Commission in whose company I spent so many happy days on the Pamirs in 1895. He was on his way back to India *viâ* Turkestan, Kashgar, and Pamir, after making a short visit to England. The next day after there came two French travellers, M. St. Yves and a young lieutenant, who after a few days' rest continued their homeward journey by way of Pamir.

When all our stores and other equipments were ready, the loads were made up and weighed, and finally fastened to a wooden framework. Two of these were then bound together in such a way as to make a short double pair of steps. In this way they were easier to lift and lash on the back of a kneeling camel. Then, having said good-bye to my friends in Kashgar, and thanked M. Petrovsky for his invaluable kind offices, and having duly celebrated my departure by a last merry feast, I started, at two o'clock on the afternoon of 5th September, to make the first stage in my journey proper.

When the camels were arranged in file, the men mounted on horse-back, and all ready for starting, M. Petrovsky took a couple of negatives; then a last greeting, a last farewell, and off we went to the dull, but significant, tingle-tingle of the camels' bells. Our road lay along the western wall of the city, past Chinneh-bagh, Mr. Macartney's house, and Kum-därvaseh, where I said adieu to my countrymen, the Swedish missionaries. We had just reached the bridge over the Kizil-su, whose water both in colour and consistency bore a striking resemblance to tomato soup, when the sky darkened in the north-west, and heavy densely packed clouds came trailing out of the mountains. But the day had been hot and sultry, and foreboded a storm. Nor was it long before we encountered the first violent gusts of wind. Up they whistled the fine yellow dust which covered the road, and drove it on before them in dense whirling clouds. Then it began to rain, and soon came down in torrents; in fact

From a photograph by] [CONSUL-GENERAL PETROVSKY.

The Start from Kashgar—In the foreground, from left to right, the two Cossacks, Kader, the Author, and Islam Bai.

I have seldom seen such rain. In a very few minutes the road was converted into a muddy puddle, and the entire caravan —men, animals, and baggage—looked as if they had been steeped in a river. Yet we had no alternative but to keep pushing on; for every house and *serai* (rest-house) in the vicinity was crowded with people. The road was, as it generally is, full of animated traffic, and when the storm burst, everybody rushed into the nearest available shelter. Besides, none of these places was spacious enough to contain our big caravan; consequently, we had to remain where we were and face the rain as best we could. The storm raged for an hour and a half with undiminished violence; the sky was repeatedly lit up with dazzling flashes of vivid, bluish-white lightning, and the thunder crashed again and again as if all the artillery of heaven were being discharged at once. Never have I heard it more awe-inspiring; it literally deafened us. But both camels and horses took it quite composedly, and tramped stolidly on southwards between the rows of willows; whilst we men derived what consolation we could from the thought that we could not very well be wetter than we were.

But, uncomfortable though the rain was, its effects were still more unpleasant. For now the road was for long stretches under water, and the soft clayey soil became so slippery, that the camels with their flat, yielding, padded feet, had the utmost difficulty in keeping on their legs. They slipped and slided incessantly, until at last their legs went from under them, and they fell. This occasioned repeated halts, for we had to stop until we got them up again. Very often they went down so suddenly and with such *aplomb*, I could well have believed they had been tripped up by some invisible giant, and when their heavy loads dumped on the ground the mud flew for yards. Shouts, cries arose from every side! The caravan halted to a man. The men rushed up and tried to get the foundered beast straight and on his legs again, or if he lay awkwardly, set about unloading him, and then had to reload him again. In consequence of this we crawled like snails through the treacherous mire. The worst places were those in which the road was uneven, and dipped down into the hollows and then mounted up again. Here we had to cut notches or steps with spades, or dig up dry soil and strew it over the soft and treacherous surface. Even then it required two men to guide each camel, and help him to maintain his balance.

Thus although our first day's march out of Kashgar was only a short one, it proved to be anything but easy. I have never left that city under more unpropitious circumstances. I could not help thinking that Heaven itself took this emphatic way of putting us in mind of the dangers and difficulties which beset the path of the traveller amongst the poplars of East Turkestan. But this was the last downpour I was destined to see or feel for many a long day; the next happened two years later, when I was in the vicinity of Lassa.

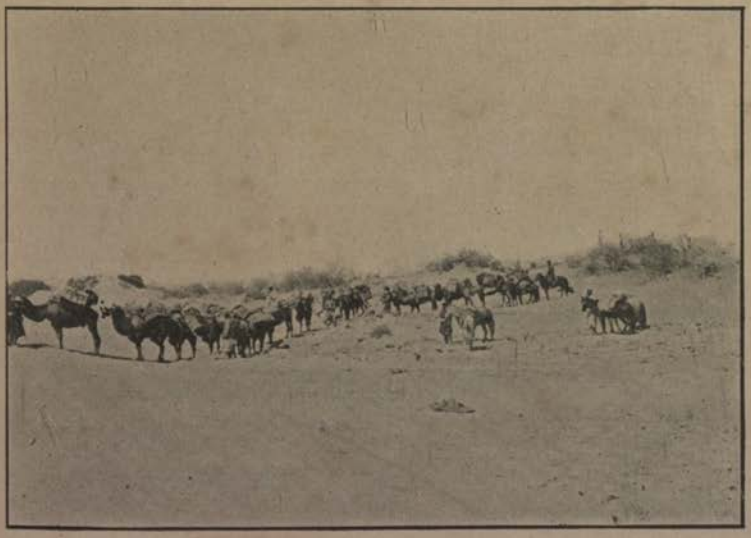
Meanwhile night was come, and in the labyrinth of bazaars and alleys which abut upon the northern town-wall of Yanghi-shahr or "New Town" of Kashgar, the paper lanterns were already lighted. It was there the road turned off to the east. Immediately outside this, the Chinese town, the road lay for nearly an hour's march completely under water, so that as we went splashing between the orchards and gardens, fields and clay-walls, we seemed to be fording the bed of a shallow river. All that could be seen in the darkness were the dark silhouettes of the poplar avenues; but the rain had stopped, and the sky was clear. The road too was better, and the camels were now able to keep their feet. It was late when we halted for the night and pitched a makeshift sort of camp at Musulman-nachuk. As a matter of precaution I deemed it advisable to post guards about the baggage.

The road thence to Lailik was for the most part known to me. I travelled over it in 1895. Hence there is no need for me to linger over it.

On 6th September we travelled through a remarkably well cultivated, though rather sparsely inhabited, region, the road being good and dry, and bordered by canals. We met two or three caravans bringing in white cotton stuffs from the Khan-arik district. Although our baggage was still wet and heavy, it gradually dried in the sun. Beyond Khan-arik we went along a magnificent avenue of mulberry trees, willows, and poplars, which afforded us ample shade. The poplars were topped to prevent them from growing too high, though the branches at the pollarded end were like a thick sheaf of vertical rods. For long stretches not one ray of sunshine was able to pierce the dense foliage, and it was a great pleasure to ride underneath its cool green arches. Indeed, in these places the road was more like a tunnel; while the camels, stalking through it with their long, even, swinging gait, put me in mind of a string

Fording a Canal near Kashgar.

of freight waggons, tunnelling their way through greenery, a remarkably striking picture. The heaviest burdens were carried by the camels which bore the Chinese silver money, especially one gigantic fellow, who stalked along with no less than forty yambas on his back. As the loads were now well balanced and nicely adjusted, we were no longer delayed through having to stop and regulate them. All that was now required was an occasional hitch or pull at the load on one side or the other. Camels have a voracious appetite, and as ours marched along they levied tribute from both willows and poplars, often snapping their nose-rope to do so. For, if the rope is drawn too tight,



My First Caravan in the Desert East of Kashgar.

it readily breaks in the middle, where the two ends are fastened together by a thinner piece of string, without doing injury to the animal's nose. The canals which bordered both sides of the road not only brought moisture to the roots of the trees, but also, by means of smaller irrigation rills, supplied water for flooding the rice fields.

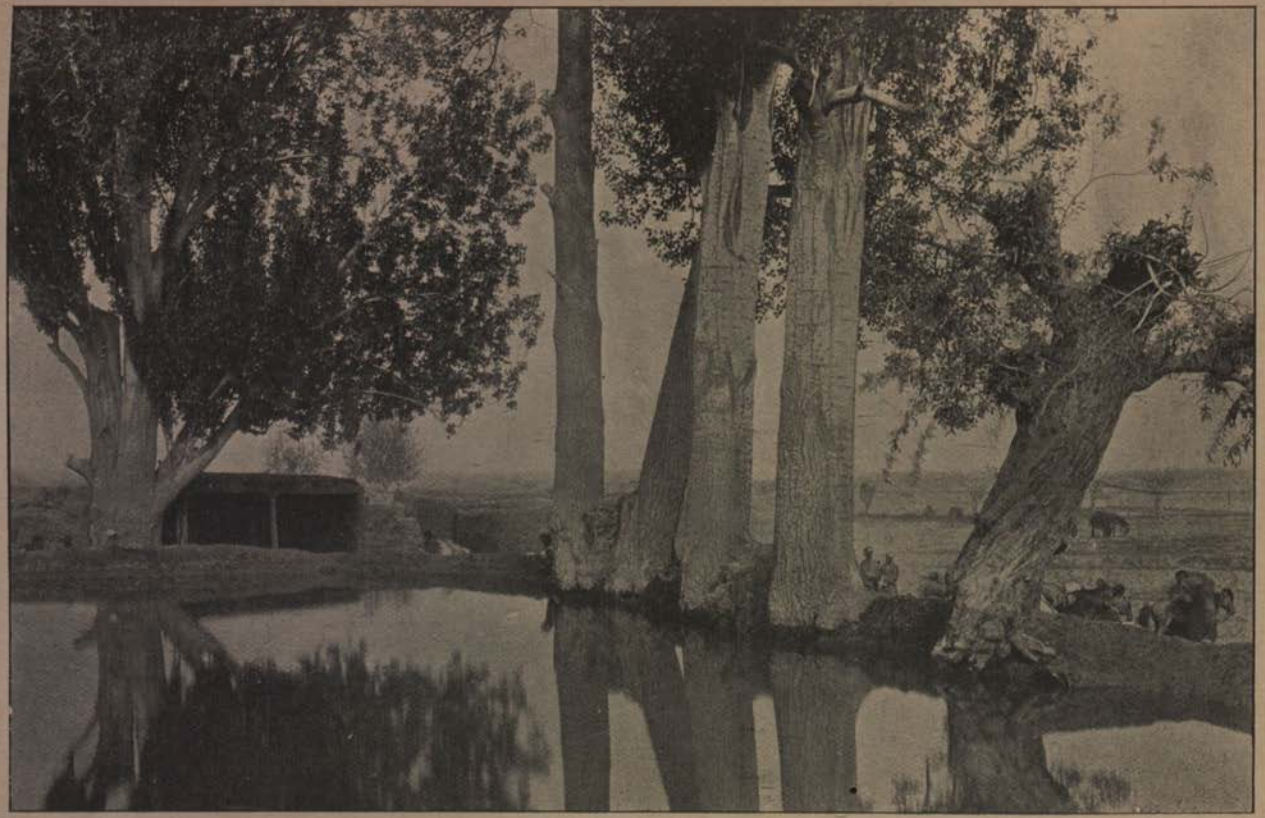
Each of my men had his appointed duty and fixed place in the line of march. First rode the two *durgaz* from Kashgar; then followed Faisullah, mounted on the leading camel, and by his side Niaz Hadji on horseback. On the sixth camel sat little Kader, gathered in a heap, and on the seventh Islam Bai. The second detachment was led by Turdu Bai, and in its wake rode Musa. The two Cossacks guarded the flanks;

while I generally brought up the rear. In this way we threaded our way through orchards and gardens and villages, between fields of maize and wheat, over *ariks* (irrigation channels), some with bridges, others without, across barren steppes and small patches of sand, where a few forlorn and isolated sand-hills, some ten feet or so in height, turned their steeper sides towards the east. That night we encamped in the town of Yupoga, and it was only by dint of searching several dug-out pools in the large canal of Khan-arik that we discovered sufficient water for our needs, for the supply was that year shorter than usual.

As the animals of a caravan are always more susceptible to fatigue during the first few days than when they have been travelling some time, I decided to make the 8th September a day of rest. The pack-saddles had not been off since we quitted Kashgar, and it was desirable to see whether the camels' backs or humps were being chafed.

The temperature was now steadily falling at night, but the day gradually grew warmer as we got away from the irrigated region and from the mountains. At two or three bendings of the road, the villagers had prepared refreshments for us in the shape of water-melons and sugar, in the hope of getting a little *douceur* in return—a form of polite attention which in the long run is apt to become irksome. We were soon through the town; and out on the "tussocky" steppe that lay beyond it we met a number of peasants, some on horse-back, others on asses, and yet others riding on the backs of oxen, but all carrying the produce of their fields and gardens to market in Yupoga. Every now and again a chain of barren sand-hills ran across the steppe; but between them were flocks of sheep, fields of maize and cotton, and dreary ariks, all perfectly dry except for a little moisture left in one or two places from the last flooding by the Khan-arik.

In the middle of a sand-pit we came upon the lonely masar of Ḥabdan Buzrugvar, decorated with streamers and yaks' tails fastened to poles. In this part of Turkestan it is no uncommon thing to find these saints' burial-places hidden away in sand-pits. On the right-hand side of the road was a belt of tamarisks, covered with graceful blossoms, which awakened melancholy reminiscences of the heather in our Swedish woods at home. The high road narrowed gradually to a mere path, evidence that the traffic decreased as the desert was approached. Upon reaching the environs of Terem, we once more encountered



Poplars and Pool of Water near a Roadside Rest-house in the West of East Turkestan.

the long irrigation canal of Khan-arik. Its sandy bottom, twelve and a half feet wide, was perfectly dry; but a number of little bridges thrown across showed that it did contain water sometimes. The avenue which flanked it consisted of young trees, but they stood wide apart, and there were sad gaps in the rows; many of them were broken down, while in other places they were entirely wanting on one side. With a view of shortening the long desert march which lay before us on the morrow, as I remembered well of old, we continued on through the town and its bazaar, and pitched our camp beside

A Short Rest in the Desert.

the last house immediately before the desert. The bazaar of Terem was quite empty and deserted; all its traders had gone to Yupoga.

On the 10th September I made for many a month to come my last journey by land. During the night the temperature dropped to 8°.3 C. or 46°.9 Fahr., a grim change from 30°.0 C. or 86°.0 Fahr. during the heat of the day. When I rose in the morning the greater part of the caravan was already on foot ready to start, and the rising sun poured a flood of golden light across the steppe, which alone separated us from the river. The day was hot, and the march long and tiring, and there were more than customers enough for the water-melons we carried with us. Belts of steppe alternated with strips of desert. Thus.

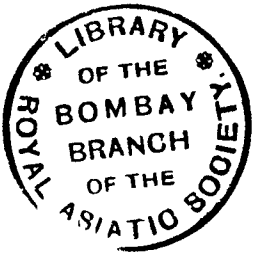
sand-dunes were sometimes sparsely dotted with tamarisks, sometimes quite bare. The people call the former *kara-kum* or "black sand"; the latter *ak-kum* or "white sand." At length we perceived evidences that we were approaching the river, in little groves of *tograk* (poplars), and I observed that they wore an increasingly fresher appearance and were fuller of leaf as we drew nearer to the great stream. When we at length reached the broad bosom of the Yarkand-daria it was dusk. At the point where we struck it the river was divided into several arms, and as the left arm, alongside which we were marching, was too shallow to make a fitting starting-point for my contemplated river trip, we pushed on for some distance north, in the dark, the bushes and branches of the scrubby timber crackling and crunching under the camels' hoofs. But as the way did not improve, and the moon dipped her silver crescent behind the woods, we halted where we were, and pitched our camp at random, all thoroughly tired after a thirteen hours' tramp. However, here we were at the river, and I was now about to try a method of travel which was entirely novel to me.

In the Desert near Terem and Lailik.

II.

Floating Down the Lonely Tarim.

A Journey by Boat Through the Desert.



CHAPTER IV.

BOAT-BUILDING AT LAILIK.

I COULD afford barely a week in which to complete the preparations for my long journey down the Tarim, so that there was not a moment to lose. The first thing next morning, the 11th September, I opened negotiations with the begs, or beks, and *kemichis* (ferrymen), by sending Islam to Merket to see if he could buy a ferry-boat. This proved an easier task than I had anticipated. In the first place, I was afraid the Chinese would be suspicious of my purpose. I also feared that, after the experiences of my disastrous journey across the desert in 1895, the inhabitants of the district would be deterred from rendering me any assistance ; for it was from Merket I started on that occasion, and the beg of the place had got into trouble through it, having been summoned before the Dao Tai, or Chinese Procurator, of the province, and censured for not providing me with a trustworthy guide. However, there was now a new beg at Merket, and he had been commanded by the Dao Tai, not only to give me a helping hand, but to treat me as a person of distinction. After a few hours' absence Islam came back and reported he had found a man who was willing to sell his boat for 1½ yambas (£10 15s.).

During Islam's absence I took the Cossack Sirkin, and tried the canvas boat I had bought in England, launching her on the side-arm of the river beside which we were encamped, and which, itself augmented by numerous small feeders entering from the main stream, rejoined this last some distance lower down. As there was a gentle breeze from the south-east, I set up the mast and hoisted sail, and away we went, the little boat behaving splendidly and sailing as steady as a rock. Then, having tried her so far, we took her through one of the small connecting channels out upon the broad river itself, and there she went every bit as satisfactorily, though we drifted down stream at a pretty smart pace. Except for a few tiny eddies,

which moved as the current moved, the surface of the river was perfectly placid, and there was neither sound nor sign of rapids. The little craft seemed, in relation to the current on which it was floating, to be standing perfectly still. Nevertheless, the banks flew past us with remarkable swiftness. And what a delight it was to be borne along in this easy fashion! It was a foretaste of the exquisite pleasure I was to derive from my several hundred miles' journey down that important river. At length I began to think it a very long way to the point where our side-arm rejoined the main stream, and also awoke to the fact that we ourselves were drifting a considerable distance

The Canvas Skiff when Rigged.

from camp. It was high time to turn back. Accordingly we got out and dragged our little craft across the tongue of soft, tenacious clay, yellow or bluish-black in colour, which separated the river from its lateral branch.

There was a current also in the latter, and although it was not at all strong, it was powerful enough to make the task of rowing against it rather fatiguing work. Sirkin therefore landed, ran through the underwoods, and presently came back bringing with him a man and two horses. Mounting one of these, my Cossack rode up the middle of the stream, towing the little boat behind him by means of a rope. In some places the bottom was dangerous, and the horse very nearly got stuck

fast in the tenacious clay; sometimes also the water was decidedly deep.

Once Sirkin went in up to his waist, while the horse, unable to touch the bottom, was carried down by the current at the imminent risk of being upset altogether. The Cossack flung himself off into the water and swam towards the boat, which I steered in his direction. But it was hard work for him to swim in his clothes, and just as he was reaching up to my outstretched oar he suddenly went down. But he soon came up again, and at last contrived to get hold of the boat-side, and very nearly upset her clambering in. All this took place so quickly that

Tent of my Men at Lailik.

I had no time to feel anxious; and yet how easily a disaster might have happened had the man taken cramp, or even been unable to swim! General Pievtsoff lost one of his Cossacks in a whirlpool in the same river only a short distance lower down. The horse meanwhile swam ashore, but had the utmost difficulty in forcing his way through the tenacious mud, though by dint of desperate effort he did so eventually. Sirkin was faint and exhausted by his exertions; but the water looked so inviting that, flinging off my clothes, I jumped in and had a most refreshing bath.

All this, however, brought us no nearer to the camp, and we should have been completely stranded had not some of my

men of their own accord come along the bank in search of us. Then, harnessing themselves to a long rope, they towed me from the bank, I meanwhile keeping the boat out in deep water by means of an oar used as a rudder.

When we got back the encampment presented a most animated picture. My tent was surrounded by a crowd of visitors, amongst them certain of my old friends of 1895, notably the beg of Anghetlik, the worthy Tokta or Togda Khoja; the former beg of Merket—Mohammed Niaz—and his sons; the *on-bashi* (chief of ten men) and *örtängchi* ("hosteler") of Lailik; besides several of the inhabitants of Merket, and women dressed in long garments of a thin red material, with their children on their arms.

At first the conversation turned on my unfortunate desert journey of 1895, the talk being frequently interrupted by such ejaculations as "Ai Khoda!" "Taubeh!" and "Ya Allah!" After that we discussed my projected journey down the Tarim, and the possibility of using a ferry-boat for the purpose. In order to settle the matter, I went to the ferry between Lailik and Merket, followed by the greater part of the crowd. The boat which Islam had picked out was a first-rate affair, newly built of sound, rough-hewn planks, held together by stout iron clamps, and as near as possible watertight. The only objection I had to it was that it was very big and very heavy. For although that would be an advantage so long as we were in the upper reaches of the river, who could guarantee that the current was equally deep and powerful everywhere lower down? If this heavy monster were to run aground on the sandbanks that lay hidden underneath the surface, the chances were it would be an awkward business to get her afloat again. I discussed this matter from every point of view with the ferrymen of Lailik. Most of them recommended me to take the craft as she was; others advised cutting her lengthwise, so as to make out of her two lighter and more easily managed boats. Others again suggested that I ought to build two new boats, of medium size and specially constructed for the purpose I had in view. This last would have been the most sensible thing to do, but it could not be carried out without fetching wood and other materials all the way from Yarkand, and that would have meant the loss of much valuable time.

I decided, in the first place, to move the craft down the river to a point on the right bank immediately opposite to

our camp ; and this was done on the following morning. Before, however, I could use her, the ferry-boat would have to be altered and reconstructed, and for that purpose it was necessary to build a kind of slip or dry dock. The left bank where we were encamped was not suitable for that purpose, for between us and the main river, and separated from it by a low tongue of wet mud, was the shallow lateral branch I have already mentioned. The right bank in its turn laboured under a disadvantage of another kind, for the river had eaten it away, leaving a steep descent of six feet sheer. But Häkim, the beg of Merket,

Our Building-slip.

requisitioned close upon a hundred men, who came with their spades, and in a very short space of time converted the bank into a gentle slope. Then, laying down wooden rollers, they hauled the big, clumsy boat up out of the water by main force, to the accompaniment of a good deal of shouting and singing. Häkim Beg, who had a larger strain of Chinese than of "Mohammedan" blood in his veins, stood on the "captain's bridge," and directed the proceedings. It was not that he made the boat any lighter to move, but his authority kept the men in order, especially as he held a long rod in his hand, which he flourished about as the ring-master does his whip in a circus. The sons of the desert worked like Trojans, and bit by bit hauled the heavy boat out of the water on to dry land, and thence

hoisted her up on to two or three pairs of cross-timbers, placed amongst the hawthorn bushes.

This successfully accomplished, we paused to consider what was the next thing to be done. Various circumstances had to be taken into account. One man told me that the greater part of the water which flowed past Lailik was deviated into a broad, shallow arm that led to the small lakes of Maral-bashi, and from them was distributed by means of ariks or small irrigation channels to the fields of the oasis just named. At the same time the Yarkand-daria itself took a more easterly course towards Chahr-bagh, and was said to be just then shrunk to a narrow, but swift current, so that it was extremely doubtful whether our big craft would be able to make her way along it. On the strength of this information, I thought it best to begin by removing the uppermost plank all round the vessel's sides, bow and stern. With this and some other pieces of wood which I bought we constructed a smaller ferry-boat, for use in case deficiency of water should force us to abandon the bigger craft. For I had made up my mind to descend the Tarim all the way to Lop-nor, and I was determined to do it somehow or other.

For convenience in crossing the river from our camp to the boat-building yard on the other side, we hired, for as long as we wanted it, one of the ordinary ferry-boats which ply between Lailik and Merket. Most of my own time was spent on the other side of the river, where the boat-building was going on, partly that I might superintend the work, partly that I might see everything was done precisely as I wished it; for in all probability the new vessel was destined to be my home for several weeks, and I wanted it to be as comfortable as possible.

And the men worked away with a will. I could easily imagine I was spending a summer afternoon in a saw-mill beside the Ångerman river at home. Cunning sawyers came from Yarkand, and clever carpenters and joiners from Merket, each man with his tools, and earned wages such as they had never earned in their lives before. We also made a smithy amongst the bushes, with a brick fire-place and bellows, and merrily the hammers rang and the sparks flew, whilst the iron clamps were beaten out for holding the woodwork together. Our friend the beg was everywhere, directing and controlling, with the greatest energy and zeal, the "host" of men who were at work building our ark.

From Kashgar I had brought with me two camel loads of

Traffic between the Building-slip and the Camp.

thin planks of strong, well-seasoned poplar wood, for the purpose of constructing a foredeck or platform, on which to put up my tent. These we nailed fast to the edge of the bulwark on the right-hand side (looking down stream), and on the left-hand side to a strong beam which was supported by two or three vertical pieces of short, stout timber. Along this side of the boat, between the beam just mentioned and the outer bulwark, we left a narrow gangway from one end of the vessel to the other.

Behind the platform, nearer amidships, we erected a small square room or cabin of vertical posts and matchwood planking. This I originally intended to use as a sleeping apartment; it would be more easy to keep it warm than the tent during the cold nights of autumn. But eventually it was converted into a photographic dark-room, where I developed and enlarged the negatives I took during the journey. The floor of the cabin was the bottom of the boat; but the structure also took in a breadth of about two feet of the floor of the tent, that is to say of the foredeck. This, extending along the whole of one side of the cabin, served as a table. Another similar table was made against the right-hand bulwark for jars, bottles, and other receptacles containing chemicals. Between the ribs of the cabin we fitted in three long, narrow window-frames, which I also brought with me ready made from Kashgar. One of these was fixed into the front wall next the tent, its lower end resting on the foredeck or table, and this we glazed with dark red glass. When I developed negatives at night or on dark afternoons, I used to put a candle outside this window in the tent, where it was protected against draught and wind, partly by the tent itself, partly by means of a wooden screen which almost entirely surrounded it.

The other two window-frames were glazed with white glass, and put one in the outside wall, the other in the back wall. When I stood up, I could see through them, namely, the river behind us and its right bank at the side; but when I wanted to develop negatives, I had contrivances for shuttering them up so effectually that not a single ray of light came through. I kept my clean water for photographic purposes in four large, iron-hooped barrels, which stood on a low shelf along the back wall. For washing the plates I devised the following contrivance. On the outside of the cabin roof, at the left-hand top corner, on a specially strengthened platform, I fixed a large tub, or

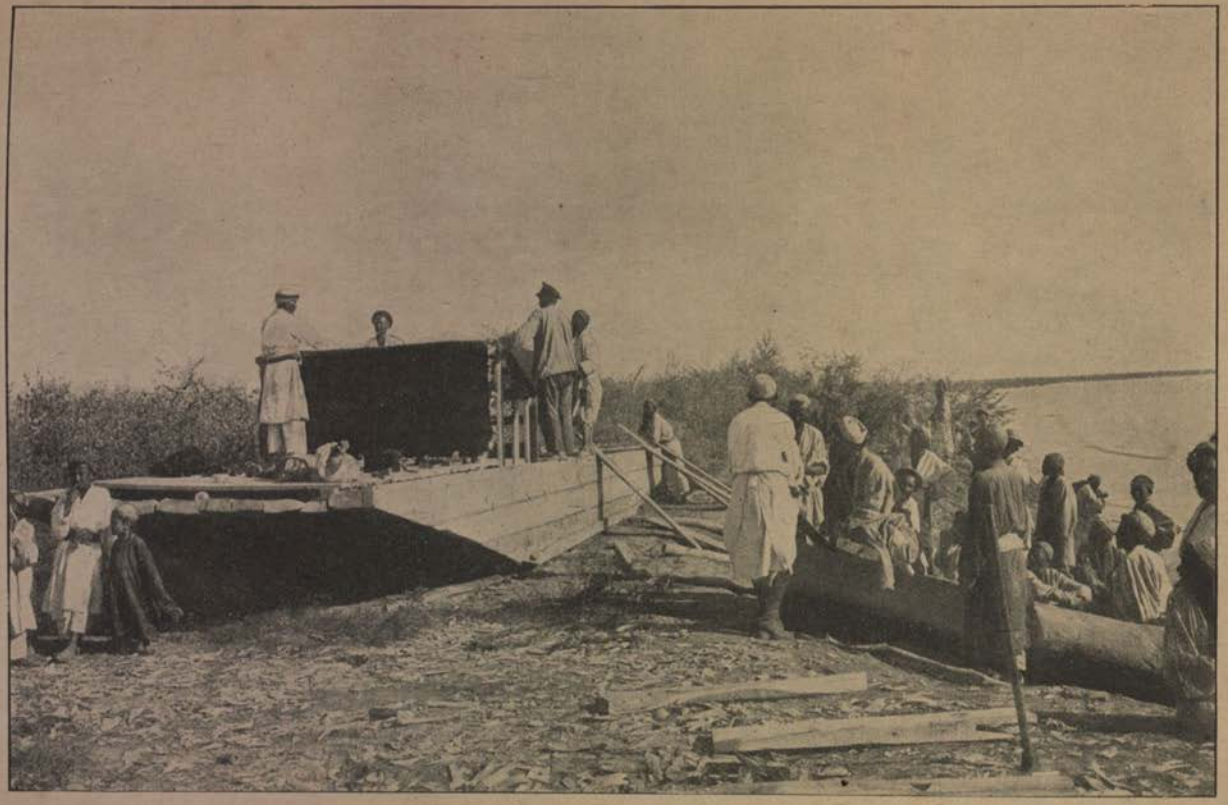
barrel, with an india-rubber tube leading out of it at the bottom ; this was carried through the cabin roof, and into a samovar provided with a tap. When the samovar was full, I shut off the supply by a clamp round the tube ; and when the tub was empty I had only to call to one of the men, and he at once filled it again. The river water was always a turbid grey owing to the mud and dust, and of course quite unsuited for photographic purposes ; but there was everywhere plenty of clear crystal water in the small side lagoons, which lay all along the river. On the other hand, it was not practicable to drain away the dirty water which accumulated in the bottom of the boat when I was developing ; but, as the boat, in consequence of the unequal distribution of our top-hamper, had a good list to the right, the waste water generally ran over to that side out of my way, and was laded out in the morning. In fact it was scarcely any inconvenience, for I lived for the most part in the tent, a good three feet above the bottom of the boat.

When the framework of the cabin was finished, we threw over it a double set of black felt carpets, and nailed them tight down at the corners and along the edges. The doorway, which opened out on to the narrow gangway on the left-hand side, could be closed by means of felt curtains fastened at the top.

The heat inside the black cabin was unbearable in the day-time, even as late as September ; but as the autumn advanced, I suffered less and less from that discomfort. Indeed, I seldom had much to do there during the day, except to go and look at any plates that might be drying, or fetch a scientific instrument or something of that kind out of the laboratory.

Behind the cabin in the middle of the boat we piled up some of our supplies, and two or three saddles, in case we should be compelled to abandon our floating palace and take to horses, as well as the boatmen's belongings ; whilst the men themselves found plenty of accommodation in the stern. There they built a small round fireplace of bricks—that was our kitchen. There, also, when the autumn nights began to grow cool, and still more when the nights turned decidedly cold, as they did at the beginning of winter, the men built up big, roaring fires of wood to keep themselves warm.

While all this was being done, we were equally busy with other preparations for our long journey. Sirkin the Cossack spent his time at the smithy, making a couple of strong anchors, or rather six-clawed grapnels, which proved of great service on



Building the Black Cabin.

several occasions. The smaller of the two was meant for the English canvas boat, and was dropped every time we went out in her into the middle of the river to measure its velocity. The smaller ferry-boat was soon finished, and its seams caulked with old cotton steeped in oil.

Nevertheless, I began to grow anxious, as I watched the river dropping an inch or so every twenty-four hours. But we pushed on with the work as fast as we could, still hoping that, if only we could clear the shallows of Maral-bashi, we should be able to carry out our voyage right through to Lop-nor.

The whole of the last two days at Lailik were taken up with the final preparations. The baggage was divided into two sections, one for the boat trip on the Tarim, the rest for the camel caravan. For the former I retained only such things as were absolutely indispensable; yet even then they filled three large boxes. Two of the boxes contained my scientific instruments, writing and sketching materials, clothes, books, etc., and the third was completely filled with the photographic outfit. When everything was at length ready, I paid the carpenters, joiners and smiths who had helped us; the beg meanwhile standing by to see that none of the men got more than they were justly entitled to.

Our little flotilla was launched on the 15th September. I took a short experimental turn in the bigger boat, and it answered capitally in every respect. The day was celebrated as a general holiday by all the inhabitants of the neighbourhood, who came down in large numbers to witness the launching. Every one of them brought "gifts" *in natura*, such as sheep, poultry, eggs, bread, melons, grapes, and apricots, so that we were well supplied for several days to come. In the evening I made a feast for the notables of the place and for the workmen who had laboured at the boats. The banquet consisted of rice pudding and mutton, tea and fruits, and whilst we ate and drank, music was discoursed by a big musical box I had brought with me for such occasions as these. When it grew dark we hung up Chinese lanterns amongst the tents, and through the bright stillness of the night echoed the melancholy strains of *nagaras*, *dutaras*, and other stringed instruments, stirring awake in my memory reminiscences of my former stay in the place. Then as now I was on the eve of setting out upon a momentous journey, with Lailik and Merket for my starting-point. Yet how different were the circumstances! On the first occasion my object

was the weird and murderous desert; now, however, on the route we were about to follow, we should not at any rate suffer from want of water. The very same musicians who played the overture to my desert journey were now inaugurating the new one; while dancing-girls, clad in long robes of white, with heavy plaits of black hair hanging down their backs, and their heads crowned with small bag-caps, danced barefooted to the strains of the music, the measure being a slow one, with jerky, whirling movements. I photographed the sirens on the following morning, but a goodly proportion of their charms were then seen to be due to the beautifying effects of the Chinese lanterns.

Musicians and Dancing-girls at Lailik.

Although everything was now ready for a start, I sacrificed yet one day more, partly that I might make some measurements, and partly that we might get on board certain stores which would come in very useful later on. Along the right bank of the river, which lay 8 ft. 2 in. above the level of the water, I measured a base-line of 1,250 mètres (1,367 yards). This distance was covered by the ferry-boat, of course on the river, in 26 minutes, and by the skiff (canvas boat) in 22 minutes 17 seconds; the difference being due to the difficulty we experienced in keeping the bigger vessel in the middle of the current, while the smaller boat was quite easy to manage. The ferry-boat consequently travelled, at any rate over this particular stretch

of the river, at the rate of nearly 50 mètres, or 52½ yards, in the minute, or a little more than 1¾ miles an hour. Walking at my usual rate when on the march, I found it took me 13 minutes 45 seconds to travel over the same measured base-line, and I required an average of 1,613 paces to do it in; consequently 52½ yards were the equivalent of 64½ of my paces. As my standard therefore for mapping the river, I assumed that we drifted downstream at the rate of 50 mètres, or 52½ yards, in the minute, and to correspond to that distance I measured 1 mm. (=.0394 inch) on the map. Of course I need hardly say that the rate at which we drifted varied very considerably at different times and in different parts of the river; but this I corrected by measuring the velocity of the current several times a day. At the point of departure the volume of the current was 3,468 cubic feet in the second, its maximum depth (quite close to the right bank) was 9 feet, its bed 442 feet wide, and its greatest velocity almost exactly 2 miles an hour.

My big ferry-boat was 37 ft. 9 in. long, 7 ft. 9 in. broad amidships, 2 ft. 9 in. high, of which 9 in. were below the water-line when the vessel was fully loaded and manned. Consequently, when there was less than 9 in. depth of water we ran aground, and this we did every day. The black cabin was 7 ft. wide, 7 ft. 1½ in. long, and 6 ft. 3½ in. high. The fore deck, or platform, on which my tent stood, was 12 ft. 1½ in. long, 7 ft. broad, and lay 2 ft. 5½ in. above the bottom of the boat. The smaller ferry-boat measured 19 ft. 8 in. in length by 3 ft. 4 in. in breadth.

Finally, on 17th September, we made a definitive start, the caravan animals being loaded up very early in the morning. My plan was to send them on by land, under charge of the Cossacks and Niaz Hadji, *viâ* Aksu and Korla to Arghan, a place on the Tarim near its termination in the desert. They were to be at the rendezvous in 2½ months' time, when we would endeavour to get into touch with one another by means of couriers or special messengers. My men took with them letters of recommendation from Consul-General Petrovsky to the Andijan *aksakals* (consular agents) of the two towns named, besides a pass of portentous size from the Dao Tai, which was escorted from one town to another by a couple of Chinese subjects, generally Mohammedan begs or gendarmes. The servants I brought with me from West Turkestan were provided with Russian passes, each having a Chinese and a Turkish translation. To the two

Cossacks, Sirkin and Chernoff, I gave presents in money, besides which they were to have free rations so long as they were escorting the caravan, so that when they returned to Kashgar they would be able to lift their ordinary pay without any deduction.

The camels were in the very pink of condition, having fattened on the young foliage of the forest during the time we

A Girl of Lailik.

were delayed at Lailik. I directed the men to take the greatest care of them on the way to Lop-nor, and not overtax them, so that when the winter began they might be in at least as good condition as they were when they left Lailik, and able without difficulty to face the hardships of a journey through the desert. I gave Niaz Hadji 4½ yambas (£33 15s.) for the maintenance of the entire caravan, and for the purchase of large supplies of rice, flour, and several other stores which we should want later on; while it was Sirkin's duty to keep a short diary as well as the caravan accounts. Having bade their adieux, the men climbed into their saddles, and the caravan disappeared

An Ordinary Ferry-boat on the Yarkand-daria.

amongst the bushes, and soon the echo of their bells died away in the distance.

I only took with me on board Islam Bai, who officiated as cook, body-servant, and general factotum, and Kader, whose proper calling was that of Mussulman secretary, though he generally filled in his time by acting as Islam's assistant. The crew of my flotilla consisted of four men, known as *suchis*, or watermen, also as *kemichis*, or boatmen, each armed with a long, stout punting pole. One man was in the prow, and two in the stern of the big ferry-boat. Their duty was to keep her off the steep banks, especially where the river made sharp turns; and owing to the strength of the current their task was by no means an easy one, and called for unceasing vigilance. The fourth boatman took charge of the smaller ferry-boat, which generally piloted the way, partly to indicate the depth and partly to warn us of shallows and sand-banks. This craft was laden to the gunwale with provisions, such as flour, rice, and fruits. The wages of these men were ten *sär* (=£1 10s.) a month and free rations. But I had some difficulty in persuading them to accompany me all the way to Lop; they had a childish terror of such distant regions, never having heard of them before.

Whilst the last touches were being given to the equipment and the provisioning of the ferry-boat, the baggage was carried on board, and Islam busied himself with arranging his cooking paraphernalia—his saucepans, cans, plates, porcelain cups and so forth—in their proper places near the fireplace on the after-deck. The tent was set up on the platform, and its loose ends nailed down fast to the boards on which it stood, and inside it I laid down a bright-coloured Khotan carpet. My camp bedstead stood at its left-hand side (looking downstream), with a big packing case at the end of it. The other two big cases stood on the right-hand side, where they made a table on which I kept my various instruments, maps, and such like things, generally in a state of picturesque confusion. My working table, which consisted of another large packing-case resting upon a trunk that contained my winter clothing, stood at the forward edge of the platform, right in the doorway of the tent, and I made a bench to sit upon out of the big box in which I packed my photographic apparatus. By unfastening the back of the tent I could get access to the roof of the cabin, where we kept a number of articles, such as sails, oars, the velocity-

instrument, and so on, that were too heavy to blow away. There also I kept my meteorological instruments, namely, the self-registering barometer, self-registering thermometer, maximum and minimum thermometers, Assmann's ventilated psychrometer, and three aneroids, besides Robinson's anemometer. The records of the last-named were, however, of very little value, for throughout the whole of the distance the valley of the Tarim was protected by the woods and high banks which bordered it. But the records of my self-registering instruments were of the very greatest interest. The readings of the barometer showed distinctly the slow and gradual descent of the stream towards the east; while the zigzag curves of the thermometer drooped lower and lower as the autumn advanced and finally passed over into winter.

The ferry-boat had been brought over as close to the left bank of the river as the spit of sand I have mentioned would allow; but for all that the men still had to wade out a considerable distance in the muddy water. Tucking up their gowns, a crowd of natives and their children came out to bid us a last good-bye, and forced upon us a number of "gifts," which we hurriedly paid for, and dismissed the bringers.

The scene on board was altogether so charming that I almost pitied those we left behind in the water, watching us as we noiselessly glided out into the current of the big river. These people had viewed all our preparations with a sceptical mien, and were now amazed to see how well everything had succeeded. It was exactly two in the afternoon when I gave the signal for the start. The boatmen thrust in their punting-poles, and we were off. The banks marched swiftly past us, and once round the first turn, we disappeared for ever from the memorable locality of Lailik and Merket.

Almost the very instant we started I sat down at my writing-table, and there I remained for months as though glued to the spot; it was at one and the same time my commander's bridge and my tower of observation. Before me lay ready to hand a piece of clean paper—the first sheet of my big map of the Tarim—mariner's compass, watch, field-glass, measuring scale, pens, knives, compasses, ink eraser, telescope, and so forth, and I set to work immediately. My table stood so far forward in the tent opening that I commanded an uninterrupted view of the landscape, not only before me, but also on both sides. Dovlet and Yolldash were at home almost from the first minute.

The Author at Work on the Ferry-boat.

During the day, so long as it was warm, they lay and panted underneath the fore deck; but as soon as it grew cool in the evening, they came out and kept me company in the tent.

Were I asked *why* I took this river journey, and *what results* I expected from it, from a geographical point of view, I should reply—in the first place, it was the only remaining route through East Turkestan which I had not already travelled over; and, in the second place, the course of the Tarim had never been mapped. Pievtsoff, myself, and one or two other travellers had journeyed from Maral-bashi to Yarkand by the caravan route which runs alongside the river; between Shah-yar and Karaul Carey and Dalgleish, and at a later date I myself, had threaded the forests which border the river bank; whilst the lower course of the stream had been traversed first by Przhevalsky and later by Prince Henri of Orléans and Bonvalot, Pievtsoff, Littledale, and the present writer. But the roads and tracks which accompany the river only touch it at occasional intervals, at the extremities of its windings; that is to say, they form, as it were, the bases of the curves described by its course. From them, however, it is obvious that no idea could be formed of the actual course of the river itself, of its general features, peculiarities, or other characteristics. What little knowledge we possessed about the Tarim was thus derived from transitory glimpses of it, and was consequently possessed of little or no scientific value. The map of the river which this journey enabled me to make proved how widely different the actual Tarim is from the course assigned to it on the previously existing maps. My voyage was, in short, a voyage of geographical discovery, and in every way eminently worth the months of labour which it cost me.

No river outside of Europe has been mapped with the same degree of minuteness or accuracy. And not only did I by continuous and daily labour gather materials for a detailed monograph on the largest river in the heart of Asia, and traverse a route which had never been traversed by anybody before, but I also discovered a mode of travel fraught with the most idyllic charm. To one hitherto accustomed to journey on horseback or to measure the endless distances of the desert from the back of a swaying camel, it was a pleasure altogether unlike anything before experienced, to have the current carry one along without jolt or jar, tranquilly, peacefully, noiselessly—to me a pleasure without parallel to sit at my work-table in the welcome shade

and have the landscape come to meet me, unrolling itself like an ever-changing panorama, while I watched it as from a cosy box in a theatre. And it was equally delightful to feel that I was, so to speak, always at home, and in my own study, with my own sleeping-chamber close by, and my various instruments about me ready for use both day and night.

Indeed, I considered myself better off than if I had been on a European or American river-steamer. In the first place, I was quite alone, and there was nobody whom I need heed except myself. When the weather grew hot, I simply flung off my clothes and jumped straight into the river from my working-table—a thing I could not of course do on a river-steamer in Europe. And if we came to a spot which for any reason offered an inducement to stop, I was free to stay there as long as I chose. I had my meals served on the table where I worked as often as I wished it, and seldom have I enjoyed my food better than during my life on board that Tarim ferry-boat. My bed and couch were as comfortable as any in a big city; and there was always an abundance of pure water and fresh air, the latter frequently laden with the aromatic scent of the poplars. Close beside me hung portraits of those who were near and dear to me. I could look at them every day, and rejoiced in the thought that their love and affection accompanied me throughout the whole of my long and solitary journey. I generally had several books lying on my improvised table, but it was very seldom I found time to look into them; every minute was taken up with work which would brook no delay. And so deeply was I interested in this work, that I should not have been sorry had the journey lasted twice as long. If I am tempted to dwell rather too minutely on this trip down the Tarim, I can only urge in extenuation that I look back upon it with the most unfeigned pleasure; and who does not like to linger over times and scenes in which he has been perfectly happy?

CHAPTER V.

LIFE ON THF UPPER TARIM.

On then we drifted with the silent but steadily moving Tarim; travelling at the same rate as the current, for we frequently had the same pieces of drift-wood keep us company for hours together. And how still and peaceful it was! Not a sound, except an occasional dimple or the ripple of the current as it broke against a branch jutting out from the bank, or the sudden "plump" of the punting-poles into the water, as the boatmen, warned by a shout from Kasim in the little ferry-boat, strove to steer clear of some shallow or sand-bank.

We had not gone very far when we perceived the banks dotted with groups of natives, both men and women; but their melons, their sheep, and other "good things" no longer tempted us, we were amply provisioned for the present. The Tarim bent and serpentined in almost every conceivable direction; for instance, we directed our course successively to the north-west, south-east, north, north-west, and north-east. The trend of the woods indicated for a long distance ahead in which direction the river wound; but at first the atmosphere was not clear, and the poplar groves grew fainter and fainter in the distance. At Kalmak-yilgazi there was quite a crowd of people collected on the right bank at a point where we drifted nearest in. But finding we did not stop, they ran after us, and at last waded out in a shallow place in the river, and climbed on board, and came and laid their wares on the foredeck in front of my study table. It turned out that the people who hit upon this stratagem for getting the better of us were the wives, children and other relatives of my boatmen. We had therefore no alternative but to accept with thanks what they brought, and—pay for them.

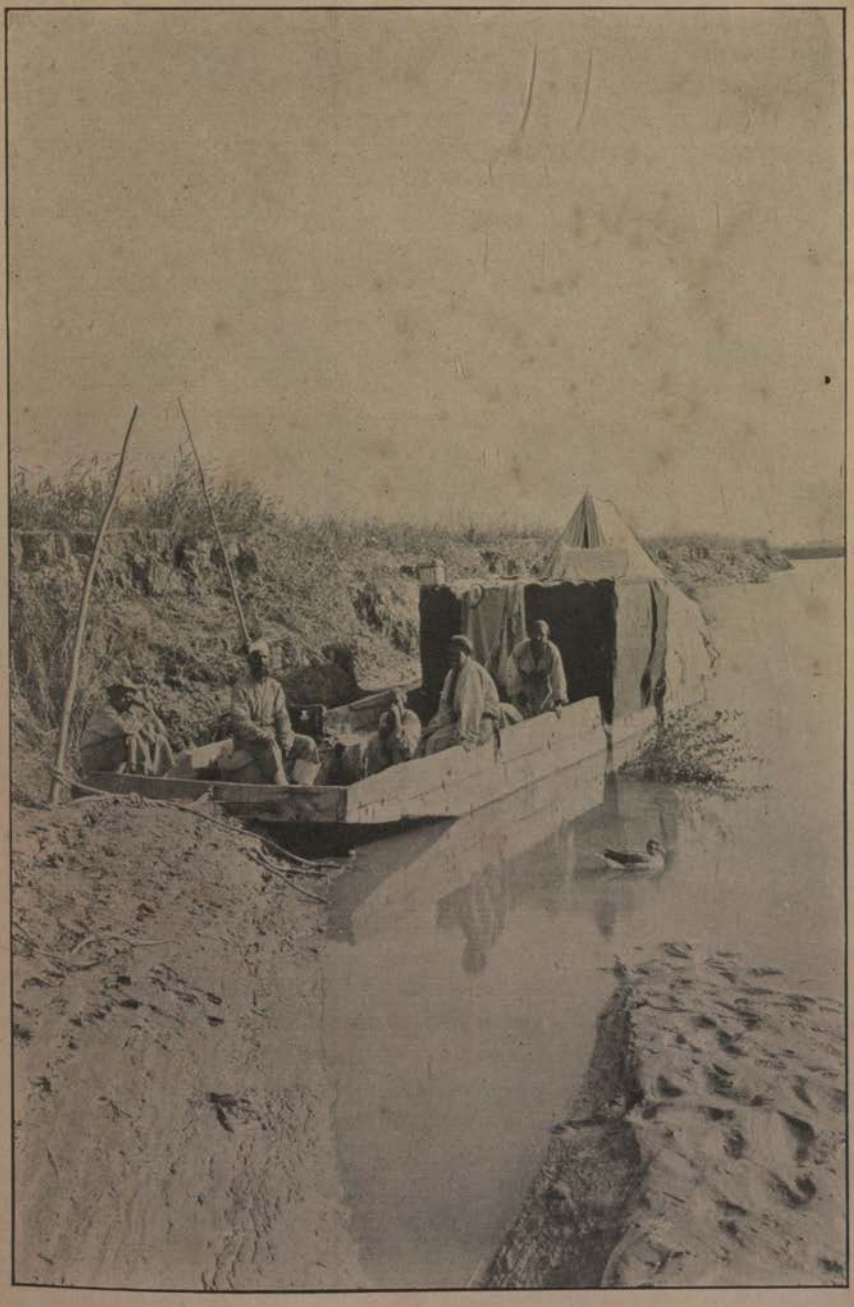
We got aground for the first time half an hour after we started; but the jar was so slight that I hardly knew the boat

had stopped, and was only convinced of it by seeing the water flowing away from us on both sides. Without more ado the boatmen jumped into the river and pushed off, and away we went again. Every time we grounded, I seized the opportunity to measure the velocity of the current. At the inner angles of the curves, the river banks were often 9 to 10 feet high. The boatmen, especially Palta, who was my nearest neighbour in the forepart of the big boat, knew the name of every stretch of bank and patch of wood for several days below our starting point, so that at first there was no need of a guide. The nomen-

Women and Children Wading out to the Ferry-boat with Supplies.

clature almost always conveyed some meaning and instruction. For instance, a particular belt of wood was called Tonkuzlik, because it was frequented by wild boar; and a ford was known as Kalmak-yilgazi (the Mongol ford), because Mongols are said to have lived near that part of the river in former times. A hostelry or guest-house (*lengher*) on the great caravan road, which we almost touched at a sudden turn in the river, was called Mohammed-Ili-lengher after the man who built it. It stood so close to the river that its tall and slender poplars towered like cypresses above the scrub and tangled thickets which bordered the bank.

At this place the stream two years ago altered its course for a short distance; the old bed, which was plainly discernible at the junction, was called Eski-daria (the Old River). Subsequently, we observed a great many instances of the same



An Encampment on the River Bank.

thing, and each was faithfully entered on my map. In each of these abandoned side-arms there were almost always a number of little pools (*köll*=lagoon) of perfectly fresh water. In the district of Avvat the river grew so narrow and the current so strong that our big boat swung completely round in a whirlpool.

In the afternoons, we were frequently incommoded by the flashing of the sunlight upon the water when we turned up the west-going reaches. But when we travelled north or east the colouring was magnificent; the sun, shining from behind us, completely transformed the landscape.

Our provision boat presented quite a picture of rustic wealth, with its stacks of green-stuffs and its melons, especially when the hens cackled or the cock crowed; for it also carried a small colony of poultry, whose function it was to supply my breakfast table with fresh eggs. Our live-stock included also a few sheep, penned on the after-deck of the big boat.

As soon as our day's journey was finished, the first business was to make the flotilla fast to the bank, lest the boats should get loose and drift down stream during the night. The men encamped on shore round a fire, over which they boiled their tea-kettles and cooked their supper. Their beds consisted of felt mats (*kighiz*) for mattresses and sheepskins (*pustun*) for coverings. I usually sat far on into the night, occupied with writing up my diary and similar work. As I sat and wrote the only sounds which broke the silence were the land-slips at the inner angles of the river's windings, where the banks were most undermined by the erosive power of the current. Sometimes, the loosened masses of silt or sand fell with a sudden plunge into the stream, as if they had been crocodiles, but fortunately those creatures did not exist in the Tarim. When the moon came out she shot a belt of silver across the broad river. In the far distance a dog began to bark. At first the gnats were very troublesome, but soon the nights grew too cold for them.

The first morning on board was fresh and cool, for I always slept in the tent. For one thing, I had then no need to keep a look-out for scorpions, which were too abundant on the banks to be pleasant. One consequence of our pulling into the bank for the night was that by the morning the ferry-boat became so deeply embedded in silt and sand, that it cost the men a good hour's work with spades and poles to get her out. Whilst they were doing this I usually took my breakfast, and by the

time I had finished, it was generally about 9 o'clock. The character of the river and its surroundings remained constantly the same, everywhere uniform. The only relief to the sameness was afforded by the young poplars, and bushes and thickets of hawthorn, which clothed the steep banks, and shot their roots out over the river, through the accumulations of silt or sand or clay which bordered it. The native names for these sheer-cut earthern banks were *kash* and *yar*, prefixes which mean "bank terrace," and occur in, for example, the words Kashgar and Yarkand.

The *kemichis* or boatmen whom I had engaged turned out first-rate fellows, who did their work splendidly. Their names were, Kasim Ahun, Naser Ahun, Alim Ahun and Palta; a fifth man, Kasim the On-bashi, gave us some help during the first few days and then returned home. All alike thoroughly understood the management of the ferry-boat, and were perfectly familiar with the peculiarities of the river. They were able to tell almost invariably from the formation of the banks, and the rippling and dimpling of the surface, whether we were in deep water or shallow. The presence of sand-banks in the middle of the river was frequently indicated by an accumulation of drift wood—trunks of poplars, twigs and branches of various kinds, and bundles of reeds—sometimes all densely matted together. The occurrence of a treacherous sand-bank immediately under the surface was generally revealed by an exceptional smoothness of the water directly above it, as well as by the quickening of the current immediately beyond it.

Here I may conveniently point out the principal differences between the convex and the concave banks which we encountered everywhere throughout the river's windings. The latter, being directly exposed to the full force of the current and its centrifugal power of erosion, were in general cut sheer down to the water's edge, and so presented a perpendicular face some 6 to 10 feet in height; and the main body of the current swept in upon its face with undiminished violence. Consequently it was in these places that we found the greatest depths and the maximum velocities. The projecting angles made by the convex banks were called by the natives *aral* or *aralchi*, which, properly speaking, means "island," and this indifferently whether the river turns to the right or to the left. They consisted in general of a flat, crescent-shaped, but sometimes blunted, accumulation of silt, always however clearly and sharply defined, deposited

by the gentle current that flows over these shallow places when the river is in flood. Had we started some six weeks earlier, the silt peninsulas would have been under water, and our course would consequently have been a little shorter, while the stream would have flowed faster. But at the time we navigated it, the current had already fallen so considerably as to barely fill the actual bed of the river. And as this wound in and out to the uttermost extremity of every concave curve on both sides, the line we actually travelled over was all the longer, and it was impossible to shorten it by cutting off corners.

On the other hand, these circumstances were all in favour of an accurate topographical mapping of the Tarim, for the shallow parts were now exposed, and it was easier to study the laws and tendencies of the river's erosive energy. Except for one short stretch, there was always sufficient depth to float the ferry boats; and the slowness of the current—on the second day of the journey the velocity was less than 1½ miles an hour—was in no sense a drawback. On the contrary, it enabled me to make my map more detailed and more complete. As it was, the rate at which we moved barely gave me time to jot down all the notes and observations I desired to make. Throughout the whole of the journey my time was fully occupied, and I was seldom able to leave my table except to sleep.

In this region, the river presented several tolerably straight reaches. For instance, we often got stretches which it took us 25 minutes to drift down, equivalent to lengths of about three-quarters of a mile. But very soon the river became more sinuous, and the straight reaches seldom exceeded three to four minutes (150 to 200 yards) in length. This hardly gave me time to note down the observations relative to one stretch before I was called upon to deal with the next. The level did not fall gradually and uniformly, but, so to speak, from step to step; and as it cut its way through the sand-banks and silt peninsulas, it left sharply eroded edges, which from time to time crumbled and crashed down, as I have already said, into the water. But as we proceeded, we found that the accumulations of silt grew bigger, while the stream itself shrank more and more into its principal bed.

To return again to the topographical features and the native nomenclature. A projecting point was called *tumshuk*; and on the lower side of this there was generally a concealed sand-

bank, which would become exposed when the river dropped sufficiently. These were the worst places we had to contend with; the men were obliged to use every effort to keep the boat off them. If, in spite of all their exertions, we still ran aground, they at once jumped in and pushed the boat off, wading round her to find out how deep the water was in her immediate vicinity. But the bottom was so soft, and the contact so gentle, that I seldom knew we were aground until I heard the men shouting *laiga tegdi* (contact with clay), *toktadi* (stopped), or *turdi* (stuck fast). Their cries when we got off again were *tyshdi* (glided off, literally fallen), *mangdi* or *mangadi* (she goes). If it was the prow that ran aground, the boat whirled completely round (*tollanup ghetti*), making me feel quite giddy. Then in a moment the features of the scene were totally changed. The sun seemed to have turned crazy, for whereas a minute ago it was at our backs, now it shone directly in our faces.

The natives also have special names for the several phenomena which regularly occur in connection with the river. The slight crumplings of the surface above a shallow they called *kainagan-su* (boiling water) or *kainagan-lai* (boiling mud). When the stream bifurcated, they employed the simple terms "right arm" and "left arm." When one of these was smaller than the other, it was called *kîtchik-daria* (little river) or *parcha-daria* (part of the river). To a cul-de-sac they gave the name of *bikar-daria*; to an abandoned arm the name of *eski-daria* or *kona-daria*, or, if it contained a separate pool, *köll* (lake). Whenever the river divided, we were generally in great perplexity as to which arm we ought to follow, and it very often happened that we anchored where we were, whilst some of us went forward in the skiff and explored the more likely arm. A deep trench in the river bottom was known as *akin* or *chukkur-su*, and a shallow as *tais*. *Ittik akkadi* and *asta akkadi* indicated that the current was flowing fast and flowing slowly respectively.

The boatman Palta sat on the fore-part of the big ferry-boat, his legs bare and his punting pole in his hands, attentively watching the river and keeping as nearly as he could in the wake of Kasim, who steered the smaller pioneer ferry-boat. He constantly had a melodious song on his lips about some king's adventures; but, like the other men, he was deeply interested in the voyage, and in all that went on on board the boats.

We several times saw shepherds with their flocks on the banks of the river. The former dwelt in huts made of branches and foliage, woven about the trees that stood on the brink of the stream. In a westward bend we again touched the caravan route to Maral-bashi, and found a man waiting for us with greetings from the caravan.

I measured the river again at Besh-köll (the five lakes), the place on the right bank where we halted for the next night. It was 283½ feet wide, had a maximum depth of 7¼ feet, a mean velocity of 1⅝ miles an hour and a maximum velocity of two

Natives of the Tarim Region.

miles, and its volume was 2,992 cubic feet in the second. These figures showed a remarkable diminution in the current as compared with the last measurements.

On 19th September we had a fresh set of experiences in river navigation. Very early in the morning it began to blow a strong breeze from the north-west, and we soon discovered that not only did it check the rate at which the boat drifted, but in the broader parts of the river, what with the slower flow and the opposition which the tent and the black hut offered to the wind, actually brought her to a standstill. On the other hand, the smaller ferry-boat now went the faster of the two. At first we steered east, with the sun in our faces, but at 8 o'clock we turned due north, and so obtained shelter against the wind; the rest of the day was bright and pleasant.

The river kept for a considerable time to the north, and the north-west wind, which was blowing at the rate of over eight miles an hour, caused us to lose 16¼ yards every minute, and drove the boat close up against the right bank, so that the men had to work desperately hard to avoid a collision. One sudden violent gust whisked away the map sheet upon which I happened to be working, and we had to pursue it a long distance in the skiff before we recovered it.

Later on, we turned to the east and south-east, and had the wind at our backs; after which the boat travelled three-quarters of a mile an hour faster than the current, which itself was moving at the rate of one and a half miles an hour. But at the next bend we turned to the north-west, and the wind became so strong against us that we were forced to stop. It was clear, therefore, that unless I made allowance for the wind, by measuring the difference between the velocity of the current and the velocity of the ferry boat, my map would present a highly distorted and incorrect chart of the river's true course.

At Shäshkak, where we next encamped, the bank was seven and a half feet high, and we had to cut steps up it. The place was inhabited by four shepherds and their families, who owned some two hundred sheep, in addition to goats and cattle. Besides that, they cultivated the ground, and grew maize and wheat, their fields being watered by an artificial canal led out of the river below Besh-köll. Here the river was not more than 139¾ feet wide, and its volume only 2,372 cubic feet in the second, showing an alarming drop within the last twenty-four hours. This made me anxious. The shepherds told me it was nearly two months since the river was at its highest at Shäshkak, and in another ten or eleven weeks it would have shrunk to its winter volume, and about a week later would be frozen over. In spring, they said, it was, in several places, possible to wade across the river.

When we awoke at sunrise next morning, the sky looked rather ominous. The night had been the coldest we had hitherto had, the thermometer dropping to 2°.9 C. or 37°.2 Fahr. The country was enveloped in a kind of twilight, due neither to fog nor cloud, but to fine drift-sand, which was being swept along by a *sarik-buran* or "yellow storm," although we saw no other signs of its presence, owing to the fact that the ferry-boat lay under the shelter of the high bank. The landscape wore a gloomy aspect, and the tamarisks and thickets of reeds which grew along

the banks became lost to sight at about a hundred yards' distance. The boatmen thought, and rightly, that under these circumstances it would be difficult to advance, and so we decided to wait until the weather improved.

On this and similar occasions I whiled away the tedium of waiting by taking a sail in my little canvas boat, although, having neither keel nor rudder, it was not exactly suited for that form of sport. Of course, I only sailed it with the wind, using an oar over the stern instead of a rudder. But on this occasion the wind was so strong, the boat skimmed along like a duck, the foam spouting high off her bow. I thoroughly enjoyed it as, avoiding the principal current of the river, I sped on upstream. The banks raced past me, the forest vanished in the haze, I fancied I was careering across an open fjord at home, and that the mud islands were so many holms. After a couple of hours of this glorious sport, I thought it was probably time to go back. So, dropping mast and sail, I steered into the main current, intending that it should carry me home. But I was reckoning without my host. The wind was so violent, it almost stopped the surface current entirely. However, I hit upon a way to counteract its influence. A foot below the surface the river flowed with its usual force, so I set an oar vertically downwards into the water, and then lashed it to the boat, and after that I dropped down stream quite easily.

At one point where I tried to land, the ground was extremely treacherous. It gave way under me, and I sank in up to my waist; indeed I should have gone in further only I caught hold of the edge of the boat in time to save myself. After that I had to take a bath with my clothes on, to get rid of the mud which clasped my nether extremities like a suit of mail.

At last I caught, through the haze, a glimpse of my white tent on the ferry-boat, and in a few minutes I was alongside her. As a rule we kept the skiff fastened to the stern of the big ferry-boat; it was useful for landing in without laying-to the larger craft. Islam Bai often got one of the other men to put him ashore in her, and then roamed the woods for hours together, and when he came back, he generally carried pheasants, or ducks, or both in his hand. By cutting off the windings of the river he travelled faster than we did, and in that way generally managed to get ahead of us. Hence it was no unusual thing for us to come suddenly upon him, sitting on

a projecting spit of sand waiting for us. And as we drifted past, one of the boatmen would go off in the skiff and fetch him on board. Islam found the journey extremely monotonous, and was glad of these little hunting expeditions as a most welcome break to its uniformity.

The weather continued on the 21st September to be cold and autumnal; in fact, it was so raw and disagreeable we were glad to don our winter clothing. The sky was overcast and gloomy, as if it were full of threatening rain-clouds. However, it was nothing but dust, brought, as was usually the case, by the east wind, for the sky was always bright and clear when it blew from the west. The wind kept in the east all day, and blew strongly and steadily, obscuring the landscape and making it difficult for us to make headway. During the night, the river had risen six inches, a circumstance not at all surprising when you bear in mind that its height was dependent upon the state of the weather in the mountains. A bright, pure atmosphere in the latter often causes the river to rise, even in the autumn, though of course only for short periods and at long and irregular intervals.

In one sharp bend, where the river turned completely back upon itself, through an angle of 180°, we sounded a depth of close upon 20 feet, while the current was terribly slow. If I had not had my map constantly before me, I should have been hopelessly befogged as to the direction we were going in, the river wound about so. Although its general course was towards the north-east, yet not infrequently we were steering for short distances towards the south-west.

The company of my dogs, and, above all, their pranks and frolics, helped to brighten many an otherwise solitary hour. They were by this thoroughly at home on board and perfectly reconciled to our method of travel. When anything on shore struck them as being suspicious, especially men or animals, they went and stationed themselves right forward and kicked up a fearful din, and the moment we stopped for the night, they, without waiting for the plank to be pushed out, leapt instantly ashore, and began to chase one another through the woods. But when supper-time came they were never absent from my side, and they always slept in my tent.

The water in the river was now so chilly that the men never jumped in if they could avoid it. The gnats were extremely troublesome, especially in the still, quiet corners (*bulung*) of

the river, while in the forest they were perfectly unbearable. They were a small grey insect, scarcely visible until just about to settle and sting; but the moment a breeze cropped up, away they went. Thus the stillness had its disadvantages as well as the wind.

At another point we saw a large troop of men and horses, the former dismounted, waiting for us on the bank. They turned out to be the beg of Aksak-maral and his attendants, and were on their way to Merket. As they had prepared a copious repast (*dastarkhan*) against our arrival, there was nothing for it but to land and partake of the good things they had provided.

We again measured the river. In fact, we usually stopped a little before sunset, so as to get our measuring over before dusk, and we always chose for our night-camp a place where the whole volume of the river was confined in one narrow channel, and there was sufficient firewood to be had on shore. I generally made my measurements from the little skiff, which was held in position by Sirkin's grapnel, and Islam Bai and one of the boatmen usually helped me. The breadth I measured directly with a tape some fifty yards long; if it failed to reach across, we stuck a stake in the bottom of the river at the fiftieth yard, and then measured off the remaining distance. After that we took the depth at a series of points along an imaginary straight line, and the velocity at two or three different depths at the same points. At the camp of Att-pangats the volume was 2,087½ cubic feet in the second. Thus the stream was gradually dwindling, though this was not perceptible to the eye; for although there was about the same quantity of water in the river-bed, it moved at a slower rate.

On the morning of the 22nd September a flock of wild geese passed overhead, steering in a well-ordered phalanx toward the south-west, their goal being no doubt India. The atmosphere was now buoyant and still, though not perfectly clear; there was still a sort of haze or shimmer in the air. As early as eight o'clock it grew so warm that we were glad to go back to our summer suits. A narrow irrigation canal, which led off to the right and turned a mill a little distance away from the river, showed that the latter, even in its present low condition, lay above the level of the adjacent country.

About an hour after starting, we caught sight of some people amongst the trees on the left bank, apparently waiting for us,

and we soon recognised them. It was Sirkin, Niaz Hadji, and the on-bashi or chief of Ala-ayghir, where the caravan had arrived two days before. We took the three men on board, and great was their delight in our new method of travel. The poplar woods were now considerably larger than they had been hitherto, so that we resembled a monastic procession moving with majestic and solemn silence through their leafy cloisters. The trees grew most luxuriantly at the inner angles of the windings, where the water gets at their roots all the year round. When we came abreast of Ala-ayghir our men returned to the caravan; and from this time onwards we were entirely cut off from them until we met them in the Lop country. But before they left me I bade them find out my former faithful servant Parpi Bai, who accompanied me on my last journey through Asia, and who was living at Kuchar, and ask him to meet us at Karaul on the lower Tarim.

At Togluk, the place where we spent the night, the river was only 116 feet broad, and had a maximum depth of 16⅓ feet, a mean velocity of one and a quarter miles an hour, and a volume of 2,105 cubic feet in the second, or a trifle more than at the last measurement. This meant, there had been a more copious influx of water from the mountains during the last twenty-four hours.

Early the next day we left on our right a side-arm of the river, which, although it was not more than 30 to 35 feet wide, and shallow, nevertheless raced along like a torrent, the reason being that the water was taking a more direct way than the main stream. Possibly it was the beginning of a new channel, into which the principal river would ere long pour itself. In one of the inner angles just here we were caught, despite our watchfulness, in the eddy of the back stream, and it was no easy matter to get out again. The punting-poles, although 15 or 16 feet long, failed to reach the bottom. The only thing we could do was for one of the men to paddle ashore with a rope, and then for them all to haul the boat back into the current.

Shortly after this we approached the point at which the river itself bifurcated. The left arm, known as the Kona-daria (Old River), was the smaller, and flowed past Maral-bashi; the right arm, the Yanghi-daria (New River), carried the larger portion of the current, and was said to have been formed only four years previously. The two arms reunited over against Aksak-maral. Hence the Yarkand-daria had, thus high up, made

a deflection to the right; and as we proceeded, we found the same thing repeated several times. This tendency was, however, most pronounced in the region of Lop, as will be shown later on.

Immediately after entering the main stream, the Yanghi-daria, or Kötteklik (Dry Timber Place), as it was also called, because of the large quantity of driftwood and logs of dead poplars which had become stranded upon its sandbanks, we stopped for an hour's rest. My men asserted we were now close upon some dangerous rapids, of which I had lately been hearing a good deal. At Lailik I was told that when we got to Kötteklik we should have to descend a fall with a drop of eight fathoms. This had now shrunk to one fathom; but all the same, we should, I was told, want 30 or 40 men to help us down. The only way to pass the place comfortably was to carry all the baggage on shore and haul the ferry-boat down the fall.

Accordingly, I commissioned the on-bashi of Ala-ayghir to have a score of labourers ready at the falls by the following morning. Meanwhile, I measured the volume of water in the two arms of the river, as they flowed on each side of a long narrow island, which was never entirely covered even in seasons of high flood. However, as the day was yet young, and as it was, moreover, still and bright, I resolved to go on with the ferry-boat, and have a look at the "dangerous place." Accordingly, on we went, threading our way through veritable islands of driftwood, the passages being so narrow, there was scant room for the boat to get between them, and the suction of the current was very considerable. For the greater part of the way the men were obliged to wade and haul the boat along with ropes, otherwise she would inevitably have stuck fast. Even as it was, she several times struck against the snags and submerged poplars, and every time she did so, she swung right round, till she came stern on. Every now and again the men who were wading first suddenly plumped into deep water, to the great amusement of the rest.

After a while we began to hear the river foaming and churning some little distance ahead. This, the men said, was the first cataract (*sha-kurun*). It did not look at all formidable, the fall not being more than three or four inches. Our boat took it quite leisurely, without the slightest list or lurch. This was followed by two other cataracts, each equally insignificant. One of them was, it is true, of considerable volume, but a little distance below it the river shallowed again.

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After we were well past this so-called "dangerous place" the river resumed its former appearance, though it was now narrow and deep, and our ferry-boat travelled at a right good pace. In fact, we shot into one sharp bend so swiftly, and the boat swung round upon us so suddenly, that we collided with the bank, and stuck fast; and the upper box which formed my table would infallibly have gone overboard, only luckily Palta seized hold of it in time. We were overtaken by the on-bashi and his score of labourers at our camping-station, beside a solitary poplar in the district of Kötteklik-ayaghi. They were tremendously taken aback to find we had cleared the cataracts without their help, and soon returned home again.

At this place we were visited by the beg of Aksak-maral; and, as he was well acquainted with this part of the country, I invited him to go with us and guide us for two or three days. He was immensely interested in the way we travelled, but was of opinion we should have encountered great difficulties had we started when the river was in full flood. We could not have found punting-poles long enough to reach the bottom; the boat would have been altogether unmanageable owing to the swiftness of the current, and we should have been in collision with the banks at every turn and winding of the river. Another drawback would have been the heat, owing to the earlier season of the year; and yet a worse evil than this would have been the midges. Which I can well believe, for even in the autumn they were a perfect plague, especially in the thickets and scrub at sunset. In point of fact, we had, he said, chosen precisely the most favourable season for our undertaking.

The volume of the Yanghi-daria or Kötteklik was only 1,303 cubic feet in the second; consequently we had lost 802 cubic feet, which was, of course, drained off by the Kona-daria that ran through Maral-bashi. If the river divided again, should we be able to proceed?

CHAPTER VI.

THE ENCHANTED FOREST.

ON the 24th September, after an early start, we made a long and interesting stage down a newly-formed arm of the Yarkand-daria. Here we said good-bye to Kasim the On-bashi, who was returning to Lailik, taking with him part of the other boatmen's earnings, which he undertook to hand over to their families or parents. Almost from the first the river was very deep and narrow, and barely 70 feet wide, and the breadth continued to decrease. There could be no question as to the recent formation of the arm we were navigating, for several times we came across green tamarisks and poplars standing on little mounds of earth in the middle of the stream. Others of these tiny islets, however, consisted simply of a mass of lumber, branches, twigs and similar flotsam, which had caught on a snag or piece of timber sticking up from the bottom of the river. In one place we observed two poplars with their roots actually in the water; they had no doubt been surprised by the current. The banks now presented a very different character from what they had hitherto done. They were no longer the high, deeply-scarped terraces we had been accustomed to travel between, but were far less distinctly marked, as indeed would naturally be expected in a newly-formed river-bed. For the same reason the tongues of silt at the projecting headlands were either very rudimentary or wanting entirely.

In the course of the day we came to an awkward and uncomfortably narrow passage, blocked with driftwood, partly massed together, partly forming slight barricades, through which we had somehow to make our way. The waterway was in some places so narrow that the ferry-boat grazed both sides, and we were compelled to proceed with the utmost caution. And seeing that the current was here very swift, and sometimes broke into white-crested waves, a collision would almost cer-

tainly have been serious. One man stood at each corner, pole in hand, and did his best to keep us clear of all impediments; while Kasim piloted the way in the commissariat boat. However, the worst mishap we experienced was getting wedged in between two accumulations of driftwood. At once every man leapt into the water, and began to push and heave and pull, all singing together in unison. Having got our craft free, one or two of the men waded on a little way ahead to see what depth of water there was in front of us.

By this the river had dwindled to a paltry rivulet, and I began to fear we should not reach the Aksu-daria and the Tarim proper. Except for two or three very short stretches, the current zigzagged backwards and forwards between scrubby forests, thick reed beds, and single togràks (poplars). But ere long it contracted into a kind of canal, flowing with an exceptionally swift current some six feet below the level of the adjacent country. The wind retarded our rate of travelling, though not very seriously, for its force was broken by the forest and the high banks. In some places the river divided and passed on each side of genuine islands, covered with vegetation. Every time it did so we wondered if there would be water enough to float us, or whether we should be compelled to haul our vessel all the way back to the bifurcation. Some of these side-arms were relatively very short, and soon rejoined the main stream; others again were a few miles long; and yet others were entirely cut off at both ends, as was proved by the transparency of the water they contained.

At length, however, the river widened out, and we obtained an extensive prospect towards the north-east, backed in the far distance by a solitary mound of drift-sand called Karauldung (Watch-house Mound). But this open, lake-like expanse soon contracted again. We chose a passage on the right of Karaul-dung, but had only gone a short distance when we stuck fast, just above a sort of threshold across the river—with only two or three inches of water over it. The bottom consisted of fine, tenacious blue clay, spiked with the stems of decayed *kamish* (reeds).

We tried to push our craft over, we tried to haul her back; all in vain. She was held fast by the bottom suction. There was nothing for it but to lighten her by shifting on shore all the heavy baggage, boxes and stores. This done, we again essayed to move her by united main force, but we only drove

her deeper into the mud. I therefore asked the beg of Aksak-maral to go to his village, and fetch men to help us. He at once landed and mounted, for two of his attendants had accompanied us all day on horseback. At the end of a couple of hours he came back, bringing with him about thirty men, who, as soon as they saw what was wanted, set to work with a will; and as I, too, encouraged them by my example, their efforts were speedily crowned with success. Foot by foot we hauled the colossus over the rapids; but a very little lower down she stuck fast again, and this time worse than before.

What was to be done now? The mud was so slippery and so tenacious, we had great difficulty in keeping our feet. We were in a queer fix. We no longer knew where the caravan was. We could not move the big, clumsy ferry-boat, and the smaller one was nothing like big enough to carry all our baggage. It looked as if we should have to construct a new building-slip, call in carpenters and smiths from Aksak-maral, and build another vessel, smaller and lighter than the one which had run aground. Yet what a loss of time that would involve! And the river was falling every day! I could not, I literally could not, bring myself to abandon my projected journey here, as it were, on the very threshold. No; we must somehow go on as we were, let the cost be what it might. Eventually we turned the boat round two or three times on its own axis, and by that means softened and loosened the mud so that we were able to push her through it, and in that way got her into deep water. After a little we came to the last and biggest of the cataracts, which was over 18 inches deep everywhere, while the fall amounted to seven or eight inches. The current was so violent the men were afraid it would capsize our leviathan. Hence, as a matter of precaution, I had the whole of the baggage once more transferred to dry land; but I stayed behind myself, being resolved to stick to the vessel as she shot the rapids—to the great concern of my men, who feared we should both be overturned in the boiling waters at the foot of the cataract. However, they guided the boat to the edge of the fall, and then, pointing her nose in the right direction, let her go. On she glided as tranquilly as possible, and when the fore part was far enough advanced, down it went like a see-saw, striking the water with a loud smack, while the after end rose high into the air. A little ploughing with the prow, a few yards more of uneasy, agitated motion, and we were safely over. As soon as might be, we

halted for the night, for it was already dusk. Then I dismissed my auxiliary corps, who one way or another had had a lively afternoon of it, and sent them home well rewarded for their exertions.

That afternoon the gnats were a perfect plague. They came in vast clouds, and it was utterly impossible to keep them off. When you have both hands engaged, and are half naked so as to be ready for an impromptu bath at any moment, the gnats of Turkestan can make themselves veritable fiends of torment. It was as if they had been patiently waiting for our arrival to hold a carnival of malice on the exposed parts of our persons. I wonder what they lived on before we went there?

At this place the river had a volume of only 802 cubic feet in the second; consequently its various side-arms had deprived it of very nearly one-third of its total flood. The successful issue of my project began to look extremely doubtful.

The sand-dune of Karaul-dung, which was about 35 feet high and covered with tamarisks and tussocks of grass, rose steeply on the very brink of the river, and its top commanded an extensive view of the whole district. The tiresome cataracts we had recently passed presented themselves from its summit as a broad expansion of the river, now split into several arms, which in seasons of flood become reunited into one stream. On the left the Yarkand-daria was bordered by steppe, on the right by scrubby forest; while farther to the east it appeared to be swallowed up by a dense forest of tall poplars. Half a mile to the south and south-east, beyond a narrow belt of vegetation, were the yellow crests of the billowy dunes of the desert.

When we started again next morning, the river once more resembled a canal, some 16 to 20 feet wide, and with a current of considerable depth and velocity, so that incessant vigilance was required to prevent our craft from running aground; in which, indeed, we were not always entirely successful. The channel we were in was also a recent creation. In some places the river had cut its way clean through the sand-dunes which lay in its path, the sand in the middle of the dunes being held in position by the roots of the tamarisks that grew on it. Some of these cuttings were 12 to 20 feet deep, and their sandy walls looked as if they were just waiting for us, ready to plunge down and bury us, ferry-boat and all, the moment we got underneath them. The surface of the ground hereabouts consisted entirely of sand, more or less continuous, except that immediately

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adjacent to the river there was a strip of mud or silt, too soft to bear a man's weight.

This day we were no longer tormented by the gnats; but on the other hand we were delayed by the east wind. One or the other of these vexations we were almost always bound to have; for no sooner did the wind drop than the gnats came. The atmosphere was thick, and the air cool and autumnal. Our chief desire now was to reach the point where the new channel which we were navigating became reunited with the Kona-daria or Old River. After that we should not only get more water, we should also return to civilized regions. For the new arm had carved its course through an entirely uninhabited country.

At last the wind became so disagreeable that we resolved to submit to its vagaries no longer; and, upon reaching an inviting nook on the right bank, near a few old poplars, known as Kum-atchal, we encamped, although the place was absolutely barren and uninhabited.

Amongst our live stock was a goose, which we brought all the way from Lailik. It travelled with Kasim in the commissariat boat, and was originally intended to be killed and eaten; but its staid and irreproachable respectability led to its being gradually promoted to be the "pet of the regiment." It was a comical bird, and often paid visits to the big ferry-boat, and waddled about wherever it liked. Every now and again it would come and have a peep at me in my tent, and was so tame, it used to come when it was called. Although it was a captive wild goose, it never made any attempt to fly away; but then we kept its wings clipped. When we encamped, the bird used to drop down into the river and swim about all round the ferry-boat; but it always returned of its own accord to its accustomed place on board. Eventually we lost the creature somewhere, though I do not now remember how or when.

After a sail in the skiff, in which I was accompanied by the beg of Aksak-maral, whose amazement at such a means of progression knew no bounds, I spent the evening in developing photographic negatives, and found the work so fascinating that I kept on at it until three o'clock in the morning, and then went to bed with the resolution to continue the work next day if the wind still remained contrary. No wonder then I was drowsy when Islam came and woke me at seven o'clock next morning. But when he told me that the wind had dropped

and the sky was clear, I was up like a shot, and having given orders to lift anchor, hurriedly swallowed down my breakfast. Before starting I dismissed our friend the beg of Aksak-maral, and sent back with him all his men except one, Mohammed Ahun by name, whom, being a *pavan*, or hunter, and well acquainted with the country thereabouts, I retained to act as guide.

Shortly after we started, our particular arm of the river was rejoined by another, which had separated from it two days before, and which brought with it a most welcome addition to the volume of the current. After this the Yarkand-daria again showed its former characteristics—a broad current, numerous alluvial deposits, and deeply eroded vertical banks. Its course now lay through a luxuriant poplar forest, interrupted here and there by small beds of reeds and belts of sand. The tops of the trees were beginning to grow torpid through the chilly autumn nights, and the foliage was deepening its tints to yellows and russets. The spell of cold wind we had just experienced was the herald of autumn's approach, and when, towards noon, the east wind again began to shake itself, the dry leaves which littered the ground set up a melancholy, joyless dance. Occasionally the wind freshened a bit, though not enough to retard our progress. The current was here pretty strong, flowing at the rate of nearly 1¾ miles an hour.

The banks were now 6 feet to 10 feet high, and perfectly vertical, and showed plain indications of the river having flowed at more than one different level in the past. On the right bank high sand-dunes appeared at intervals, shooting straight down into the river which gnawed away at their feet. These were the extreme outliers of the great "ocean" of sand-hills which covered the desert to the south and south-east. Once, when sweeping round into a sudden elbow, with a swift current under our keel, we came into collision with a decaying poplar, which stood in the stream about two yards or so from the right bank. The men did not perceive it soon enough to clear it entirely, and we scraped and bumped all along its stem, while its big branches very nearly swept my tent clean away. The box which contained the meteorological instruments was also for one moment in great jeopardy; but I just managed to get hold of it in time, and saved it.

At last we reached the long-wished-for confluence of the Kona-ḍaria. But, except for a pool of bright blue water close

to its mouth, its broad bed was dry. Two or three times we ran aground upon the submerged sandbanks, it being difficult to detect their presence owing to the crumpling of the surface by the wind.

In this part of its course the Yarkand-daria flowed on the whole towards the north-east, though at times it turned towards the north, the east-north-east, and occasionally towards the east-south-east, describing in each of these directions the most fantastic curves and sinuosities imaginable.

But the region was still uninhabited. We did not see a single human being, nor a single hoof or horn during the whole of this day, the 27th September. The only creatures which disturbed the solemn silence of the woods and waters were a solitary eagle and a few ravens, though in the sands beside the river we often observed the fresh tracks of wild boar and deer which had been down to the river to drink.

The measurements I took that afternoon were of great interest. The river was 261 ft. wide; its mean depth $2\frac{1}{2}$ ft.; its maximum depth $3\frac{1}{2}$ ft.; its mean velocity $1\frac{1}{4}$ miles an hour; and its volume $1{,}225\frac{1}{2}$ cubic feet in the second, or close upon half as much again as when I measured it last. This increase was due to the fact that by this the stream had again caught up all the side-arms which it had previously shed off. During the day we sounded depths of as much as $26\frac{1}{4}$ feet.

Thus we glided on day after day down the still, but persistent river, and day by day my map of it grew bigger and bigger in volume. During the night of the 27th September the surface dropped over three inches. I always measured the level of the stream at every camping station, and for precaution's sake measured it by two distinct methods. Choosing a quiet and sheltered spot, where there was practically no current, I put down a graduated pole till it rested on the bottom. The other device was to thrust the pole horizontally into the vertical bank, and from its outer end drop a plummet swinging in a graduated arm.

The banks were still uninhabited, but we did see two or three shepherds' huts (*söreh*), each consisting as a rule of a roof of branches and leaves resting on four uprights. It was clear that the district had been visited at some time or other, and been deserted when the grazing gave out. The river itself, gathered into a single bed, with a depth which in some places was as much as 23 feet, still rolled on in its usual fashion, through

the majestic silence of the woods. The trees, poplars of a venerable, though dwarf and gnarled appearance, whose green crowns were beginning to change into gold and red, as if adorning themselves for a merry autumnal carnival, stood in close array, and made a magnificent framework for the glinting river. The Lailik boatmen had never seen any forest like it; its autumnal splendours drew from them repeated exclamations of astonishment and delight. They called it Östäng-bagh, which properly means "the orchard beside the canal," the general name for the irrigated parks and gardens of the East Turkestan oases. And there was really no hyperbole in this expression of their feelings. The magnificence of colouring which the foliage of these poplar woods presented was a source of genuine delight. Often and often again I could not help fancying I was being drawn in a car of triumph through a magic wood, by invisible elves and gnomes, along a pathway paved with sapphires and crystals. And there was a mystic charm also in the unbroken silence which brooded over both river and forest alike. You hardly dared to speak, lest you should break the magician's spell. Solemnly and in a deep and serried phalanx stood the poplars, as they had stood for hundreds of years, guarding the borders of the river, and mirroring their crowns of autumnal gold in the life-giving stream, the sustainer of the woods, the milk-mother of the wild deer and the royal tiger, the bourn of life to the lonely shepherd of the desert. There they stood like a dark wall, at once the antithesis and the rival of the hungry desert behind them—stood in silence, in an attitude of reverence, as if listening to some hymn of a thousand years that was breathed up through their branches in adoration of the Supreme, a hymn which the wanderer and the traveller *may* indeed hear, if only his ear is attuned to the moving and matchless notes of Nature's greatness. Their one and only object in existence seemed to be to pay homage to the wonderful river, which not only brought the life-sustaining moisture to their roots, but saves the whole of East Turkestan from becoming one of the most desolate and barren regions on the face of the earth. In their reverent worship of the Tarim they were like the Brahmins and other Hindu pilgrims, who strain onwards to Benares, if only they may die in the sacred waters of the Ganges, which they also reverence with a holy love.

The forest stretched right down to the very brink of the river; but the steep faces of the banks were screened by a

thick belt of yellow reeds, and immediately behind them the bushes formed an absolutely impenetrable thicket, through which nothing penetrated save the wild boar, by tunnels and dark gangways into which no ray of sunshine ever strays. High up on the sky-line ran the green coping of the poplars' crowns, making a dense curtain of foliage which seldom allowed a glimpse of the tree-trunks to gleam between—green, but green shot with various shades of rich brown, so rich that they would have been harsh had their effect not been softened by the hazy sky behind them. And all this glory of colour, all these silent har-

A View down the River from my Tent. On the right is my Work-table, on the left my Bed and Palta the Boatman.

monies of nature, were mirrored mile after mile on the sensitive surface of the placid river. I never grew tired of admiring it.

Thus we glided on through the heart of Central Asia, beside one of the greatest deserts of the earth, as though we were floating down the avenue of a park, a canopy of green leaves above our heads and a mantle of refreshing shade wrapped about our shoulders. Truly a wonderful journey! No need now for the boatmen to be incessantly on the watch. The river carried us safely and well. Our craft might have been a gondola drifting through the water-streets of Venice, save that our palaces were the groves of the poplar forest. Even the rude boatmen of Lailik felt the magic spell of those ever-silent woods,

and almost slumbered at their posts. As for me, I kept expecting every moment to see the nymphs of the forest rocking on the branches that overhung the river, and laughing as they watched the reflection of their own dainty figures dimpling on its surface; nor should I have been the least surprised had I heard the plaintive notes of a pan's pipe, the music of the shepherd's god, come stealing through the forest trees. Yet no revelation from the world of faërydom came to break the solitude of our journey. All the forest had to give us, apart from its wealth of poetic suggestions, were the wilting leaves it showered down upon the bosom of the Tarim, like the yellow flowers which the devout Hindus scatter upon the waters of the Ganges.

Our fluvial highway was on the whole very sinuous. At one place, although we drifted 200 yards in a straight line towards the north-east, our actual route of travel measured a distance of 1,600 yards; in other words, we described eight-ninths of a circle in order to advance the remaining ninth. It was very seldom indeed that the river flowed in a straight line, and then only for a short distance. Its course through the woods was in fact like that made by a snake wriggling through the long grass. This added very greatly to the work I had to put into my map; for, if it was to be accurate, I could not, of course, afford to disregard all these little windings and sinuosities.

Towards evening the gnats began as usual to dance for their supper—and got it. I protected myself as well as I could with olive oil; but the boatmen, who always went barefoot, had a pretty rough time of it. Smack! smack! was heard unceasingly from each end of the boat, accompanied by exclamations such as "Annangnisskeh!" "Kissingnisskeh!" "Kaper!" words which are much more expressive if left untranslated.

At Yallguz-yiggdeh, where we encamped for the night, the forest thinned out a little, and was intermingled with sparse young forest trees and tamarisks, and broken by belts of reeds and sand-dunes. That night around the fire on shore we held a council of war. Mohammed Ahun, the hunter, the only man who knew anything about that part of the country, declared the river would freeze in two months' time. Hence, with the view of saving time, I ordered that for the future we should start every day as soon as we could see, that all meals were to be taken on board, with the exception of supper, and that our daily quantum of bread was to be baked in the oven on the after-part of the big ferry-boat. The men were anxious to get to

Masar-alldi or Avvat, for they were ill-supplied with *chapans* (cloaks), pelts, and boots.

Mohammed Ahun, the hunter, told me that two or three miles from the right bank of the Yarkand-daria I should find the dry bed of the Khorem, in which I discovered pools of fresh water in 1895; and that beyond it to the south-east stretched the boundless desert.

That evening the volume of the river was only 1,010 cubic feet. Owing to our stoppages during the night the river dropped at a relatively faster rate than it would have done if we had drifted continuously day and night without stopping; though the relation was of course affected also by the losses due to evaporation and absorption into the ground.

Copious dews now began to fall during the night. They came on shortly after the sunset, and in the morning the deck was as wet as though a shower of rain had fallen. On the 29th September we travelled for the most part between alternating steppes and young, virgin forests; the venerable poplars of the past day or two only survived in small groups and in single trees standing at wide intervals apart. In the morning appearances looked more favourable. The river was less sinuous than usual, and the air was perfectly still, so still that the chief thing which affected the anemometer was the steady pace at which we travelled. But about noon these favourable conditions came to an end. A crisp breeze sprang up, and the river once more began to meander in the old way. In the elbows or inner angles of the curves the current was sometimes as much as 29½ feet deep; and the back-stream, which was generally set up on the surface in these *köll* or *bulung*, as they were called, once or twice brought us to a standstill. As a rule we managed to punt ourselves out of them; but when the wind was against us, it was necessary to send a man on shore with a line to haul us out, and sometimes we had to yoke the skiff in front of the colossus, and tow her out.

Here the river was not only deep, it was also broad, and carried a comparatively large volume of water; but its rate of flow was relatively slower.

At Tuzluk-kash we passed a shepherd's encampment, standing on a peninsula which was surrounded on eleven-twelfths of its circumference by the river, and bought a sheep for 48 tengeh (nine shillings). The many windings of the stream in this part of its course made our actual route twice as long as it would

have been could we have gone in a straight line as the crow flies. For example, on the 29th September we only advanced 5 miles towards the north-east, whereas we actually traversed 12 miles, at the rate of close upon 1½ miles an hour. As a result of the slower rate of flow and the greater depth the water became more transparent. It occurred to me that I might measure its transparency, and with that end in view I constructed a very simple instrument, consisting of a bright metal disk fixed to the bottom of a graduated rod. By its means I determined the transparency by ascertaining the depth to which the disk was visible when plunged vertically into the river.

Great though my enjoyment of the journey was, I was never able to quit my post for an instant to stretch my legs. We hardly ever travelled more than ten minutes in a straight line; as a rule, we seldom went longer than two or three minutes at a time without altering our direction. Hence, I had to keep my eye upon the compass. In fact, in this part of the Yarkand-daria I was tied down so closely to my map, that at one o'clock, the time for taking the readings of the meteorological instruments, we were often obliged to pull into the bank and stop whilst I did it. My first observations were made with pencil in a common note-book, which always lay open before me; these, when we stopped for the night, I transcribed in ink into a diary. In the part of its course in which the river wound most frequently, I was so incessantly occupied that I had hard work to keep my cigarette alight, and if it chanced to go out hardly found time to relight it; and many a time the tea which Islam made for me stood on the box by my side until it was cold before I got an opportunity to drink it.

The map, however, grew under my hands as the days went by, and I worked away at it with real enjoyment. It was planned on such a large scale that every turn of the ferry-boat's course is shown, every deviation it made to right or left, every halt by the river's bank, every crossing from one side to the other; in fact, it presents an exact reproduction of all the vessel's movements to and fro upon the surface of the river. The sharply-outlined banks or steep terraces, at the foot of which erosion works with the greatest effect—the bottom of the river suffers but little from this cause, and what there is is counter-balanced by the deposition of sedimentary matter—are indicated by sharp, black lines; the alluvial peninsulas as white crescents; and every island, sandbank and subsidiary side-

channel is duly laid down in its proper place. The poplar woods are marked by tiny circles, the reed-beds by small arrow-heads, bushes and thickets by dots, tamarisks by barbs, and sand-dunes by the conventional stippling generally used to indicate mountains. When the forest thinned out, as it did on the 29th September, I marked every individual poplar tree. I believe, if I were to visit that region again, I should recognise every one of them as an old acquaintance.

The place we encamped at that day was called Kiyik-telehchöll ("the desert of the antelope willow"), an open steppe, where the gnats were not quite so troublesome as usual. The volume of the river was 982 cubic feet in the second.

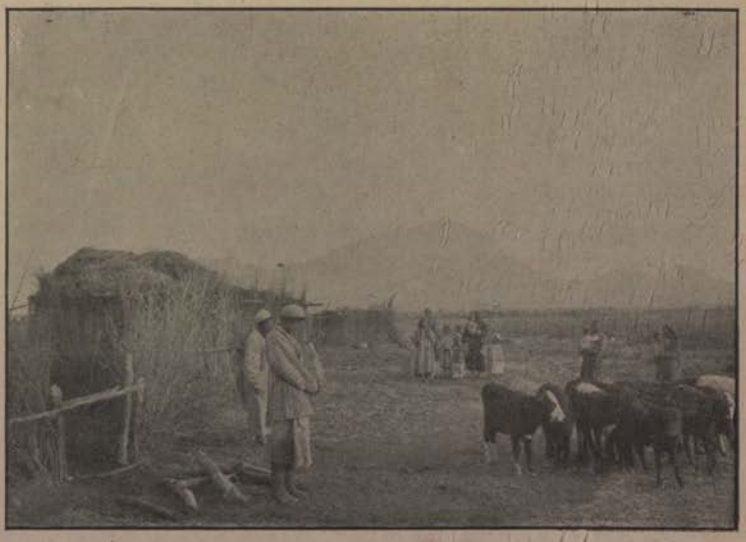
During the following night the Yarkand-daria again fell 8¼ inches. We must consequently keep pushing on as fast as we can. On the 30th September the air cleared a little, and we caught sight of my old friend the Masar-tagh, towering skywards to the north-north-east. At first we could only perceive the faint outline of the mountains; but as the day wore on they became more and more distinct, until we were eventually able to distinguish the spurs and indentations of the range, as well as make out its brown colouring. This brought some relief to the monotony of our outlook, and formed a new topic of conversation. For a considerable distance the mountains lay directly ahead of us; then they appeared on our right, and after that on our left; and finally they stood right astern of us, and we seemed to be sailing away from them. It was only after we got this conspicuously fixed landmark that we saw clearly how greatly the river wound to and fro.

By this time the woods had disappeared, and the country become more barren. Grass and reed steppes stretched away from both banks, and it was the rarest sight to see a solitary young poplar lifting its head above the grass which nobody apparently cared to appropriate. Our hunters detected signs of deer and other wild animals. Islam seldom shot anything but ducks and geese: age was beginning to tell upon him. As for myself, I have not the destruction of so much as even a crow upon my conscience. During the whole of the journey I never fired a single shot. I did, it is true, carry a revolver for self-protection in case I should be attacked; but it was always packed away in one of my trunks, though in which of them I hardly ever knew.

At a desolate place on one of the banks, Kasim, the man

who steered the commissariat boat, found a solitary stray lamb. We took it on board and carried it with us, intending to hand it over to the first shepherd we met. Had we left it where it was, it would very soon have fallen a prey to some prowling wolf.

The sinuosities of the river were not quite so capricious as on the preceding day; but the east wind checked us a good deal. One peculiarity of this particular part of the river was that its banks were much higher than they had hitherto been, namely, 12 to 16 feet above the surface of the current. One punting pole, although nearly 20 feet long, was seldom long



A Shepherd's Hut near the Masar-tagh.

enough to reach the bottom, and when measuring the depth it became necessary to lash two of them together. Sometimes both banks were equally high, and without a trace of alluvium; this was, of course, in the straight stretches. Here, although we were sheltered from the wind, we could see but little of the surrounding country. In one locality, however, we perceived a few shepherds, who possessed a clumsily-made boat, sadly different from the slender, graceful canoes used by the Lopmen.

The mean velocity of the current at Camp no. XII., situated in an unnamed district, was over $1\frac{1}{4}$ miles an hour, and the volume 883 cubic feet in the second, consequently 99 feet less

than on the day preceding. In the direct line we had advanced 7 miles, though our actual course measured 11¼ miles, a far better record than that of the day before.

Day by day it became an increasingly anxious question, whether we should succeed in getting through before the river became ice-bound.

CHAPTER VII.

A REEDY LAKE AND A MOUNTAIN CLIMB.

DURING the ensuing night the current dropped another half inch, and it was transparent to a depth of $5\frac{1}{2}$ inches. Away to the north, a faint contour, which might well have passed for rising mist, had it not been for its serrated edge, showed the mountain range of the Tian-shan. The Masar-tagh too came out much more distinctly. Every hour its structural features, and the play of light and shade across them, became more and more intelligible; and I was able to map them in the perfection of comfort, as we slowly drifted on towards them. On my map I indicated the individual peaks of the range, easily recognisable by Roman numerals.

The river-bed was sharply eroded, but narrow, and the banks 10 feet high. The depth of the current was however less, and the velocity $1\frac{1}{2}$ miles an hour. We frequently ran aground, and did not always succeed in getting off easily owing to the pressure of the water. Steppe country predominated on both banks. Amongst the steppe fauna which we observed, a species of hawk was very common. Two or three times we caught sight of shepherds and their flocks.

Before long we came to the outlying spurs of the Masar-tagh, their feet actually washed by the river, so close did they advance to it. I should not have been surprised had there been falls or rapids here, where the Yarkand-daria and the mountains came into contact; but there was nothing of the kind. The river, instead of forcing a path through them, swung off to the south-east, so as to skirt the southern extremity of the range, and in that way turn their flank. Immediately above the point where it deviated, the river was joined by two turbulent rivulets, both entering through deep trenches cut through its steep bank; they brought bright, clear water

from a string of lakes, which were fed by the overflow of the Kona-daria of Maral-bashi.

Soon after we turned and began to skirt the base of the Masar-tagh, we perceived huts and people on the banks, then four *gumbez*, or mausoleums, on a declivity of the mountains, and shortly afterwards an old *guristan*, or burial-place. A little past this last we halted beside the huts of Kurruk-assteh.

The burial-place just mentioned was known as Hazrett Ali Masar, from the *masar*, or tomb, which it enclosed. The same name is also applied to the range as a whole. At the foot of the masar the Yarkand-daria gave off a large arm, the Kodai-daria, which I visited in 1895. It had, however, dried up ten days before our arrival, and therefore deprived us of none of our current; although from the middle of July to the 30th September it had drained off water to irrigate several villages on the Aksu road. Here again, as so often throughout its entire course, the great river manifested a tendency to shift its course to the right. But the Chinese *amban*, or governor, of Maral-bashi, wishing to check this tendency, and save the crops of the vicinity, had issued orders for a dam to be built before another year, so as to deflect the stream back into the Kodai-daria. Accordingly, at Kurruk-assteh, we found five men watching a pile of some thousand beams and other pieces of timber, which had been brought thither on *arbas* (carts) from the nearest forest. As soon as the river dropped sufficiently, the amban intended to raise a *corvée* of the people of the neighbourhood and have the dam built. Fortunately for us, it would be a month yet before the work could begin, and by that time I hoped we should be so far away that this stoppage of the river would in no way affect us.

We decided to stay at least one day at Kurruk-assteh. Summoning the on-bashi of the place, I commissioned him to go to the bazaar of Tumshuk, and buy pelts and boots for my boatmen, and I also bade him procure a supply of rice, flour, and vegetables. He promised to return by the following evening. Unfortunately I was not able to send any of my own men with him, for there was only one horse in the whole of the district. But I trusted to the man, and gave him the money to pay for what he bought.

After developing photographic plates until 3 o'clock in the morning, and having a good sleep after it, I devoted the rest of the day to a well-earned and much-needed holiday. As

a rule, I worked sixteen hours every day, and often grew quite stiff from sitting still so long at a time. By way of a thorough change, therefore, I took a good walk, and climbed to the top of the hill of Hazrett Ali Masar, to have a look round the neighbourhood—the boundless steppes; the yellow desert, with its weird and lofty sand-dunes, here also called Takla-makan; and the winding river, which from the point of view where I stood looked like a mere trench, a glittering narrow blue ribbon flung across the face of the open country.

At dusk I measured the volume of the river, and was agreeably surprised to find it 1,897 cubic feet in the second; that is to say, more than double the quantity of water at the last measurement. This satisfactory state of things was due to the two affluents which joined the river above Kurruk-assteh; and as the water they contributed was perfectly clear, the transparency of the Yarkand-daria was now increased to $8\frac{1}{3}$ inches.

But we heard nothing of the on-bashi. It grew late, and yet he did not return. I began to think he had run away with my money. If he had, we were in no position to follow him, for we had no horses. Nor did he come on the following day either. We were, therefore, obliged perforce to wait. This enforced delay I turned to account, by making another excursion to the left bank of the river, that is, towards the north-west.

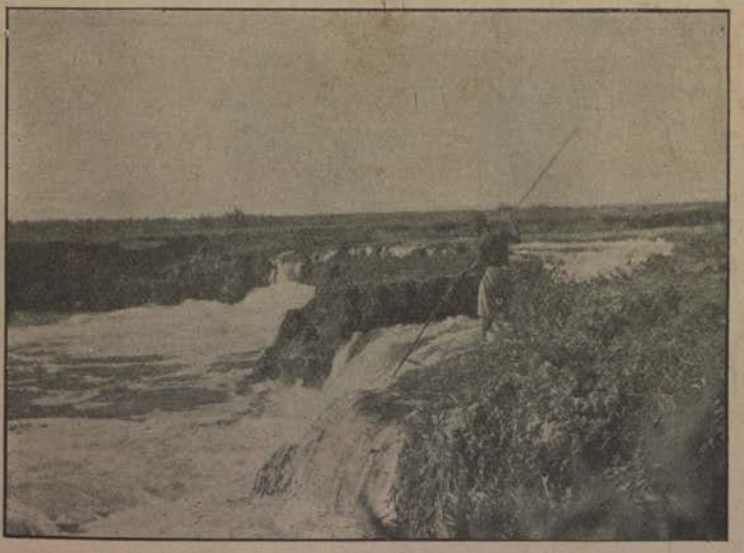
I walked as far as the two affluents I have mentioned, to see how Kasim caught fish. The place he had chosen for his operations was the spot where three rivulets met, all coming from the lake of Shor-köll, one of the basins fed by the overflow of the river of Maral-bashi. In other words Shor-köll was a steppe-lake, or, if you like, a swamp, for it was impossible to get to it by reason of the broad expanse of soft ground, covered with luxuriant grass and reeds, which hemmed it in. This irregular, polyp-shaped lake, with its multitude of creeks and little bays, its thousands of islands and peninsulas, was the filtering basin of the two affluents already mentioned, so that the water which they contributed to the Yarkand-daria was, as I have already said, as bright and clear as crystal.

At the place where Kasim was fishing, the eastern affluent tumbled down a waterfall about five feet high, divided in the middle by a small islet. Down the incline it raced in boisterous tumult, and boiled and churned itself into foam at

Our Camp at Kurruk-assteh.

the foot of the cascade. The banks were here six to eight feet high, and rose straight out of the water.

The fish (*balik* or *asman*) frequented the boiling pool at the bottom of the fall; though they frequently showed themselves above the water, when with a clever, elastic bound, they tried to leap up the fall, exactly as salmon do. The instrument Kasim used for catching them was a kind of eel-spear, a sixteen-foot rod or javelin called a *sapp*, consisting of two parts, the lower made of tough tamarisk wood, the upper of pliant willow. At the end were two hooks (*satchkak*), with the points pointing



Kasim Fishing.

downwards and the barbs pointing upwards. They were loosely fixed, so as to become detached the moment they struck; but were secured to the rod 18 or 20 inches higher up by means of a strong cord.

In the space of about a minute, Kasim captured two big fellows, and after that several others. He stood on the edge of the water, holding his spear ready poised like a harpoon, and when he caught a glimpse of a fish, down went the instrument like an arrow. You heard the shaft whizz, you saw it vibrate, you saw the foam fly, and the water splash, and the next moment there was a big *asman* flopping and floundering on the bank, spiked on the end of the *sapp* as though it had come there by witchcraft. It was both a novel and an interest-

ing spectacle, and we were supplied with fish for several days to come.

Late that evening the on-bashi turned up at last, bringing with him everything he had been commissioned to buy. He had also procured me a new guide, a hunter.

During the night of the 3rd October, it blew such a gale that the tent-poles creaked and the ropes whipped incessantly against the canvas. Next morning also there was a strong breeze; and as it came from the east-north-east, it was of course adverse to us. In fact, it blew so hard that the surface of the river was an expanse of combing crests, which fell over short and abrupt, owing to their being forced against the current. This rendered the task of piloting us more difficult, as it was impossible to see which side of the river the current ran. It was, however, very pleasant to hear the waves rippling against the ferry-boat; but they were no friends to us, they kept us back and hindered us. The tent too proved an obstacle to progress, because, catching the wind like a sail, it caused the boat to tilt over to the lee-side. I therefore had it taken down, after first removing all my loose effects to the inside of the black cabin. All this made our rate of advance painfully slow. The only time we were able to progress at a normal rate was when we obtained shelter from the wind under the high river-banks. If only it would blow from the west, were it only for one day! But no, the wind was always against us.

The bed of the Yarkand-daria now ran to the east-north-east, and during the whole of this day (4th October) it resembled an artificially made canal. Its breadth was everywhere the same, 150 to 200 feet; the banks, which were lined with luxuriant reeds, scrubby bush, young forest, and thickets, were exceptionally high; and the curves well rounded and easy, without any very sharp or awkward turns. There was no trace of alluvial deposits.

During the course of the day the river did, however, describe one curve which came very near to being a complete circle. We heard a shepherd singing in a clear and melodious voice in the woods close beside us. Then the river swung off to the north, and the song died away in the distance. A fresh bend, and we again heard the song. It grew nearer and nearer, and at last there it was again, quite close to us. The singer had never moved, but sat all the time in the same spot in the forest, watching his sheep as they grazed amongst the

trees ; it was the river which had looped round upon itself, so as to bring us once more within sound of the man's glad and light-hearted song.

To the east we saw two other isolated hills peeping above the horizon. They were the Chokka-tagh and Tuzluk-tagh, from which I started on my disastrous journey across the desert in 1895. The lake beside which we rested on that occasion was called Yugan-balik-köll (Big Fish Lake), and was fed by rivulets from

Kasim with his Catch.

the Yarkand-daria, to the right of which it lay. As the name indicates, the lake was well stocked with fish ; and in the spring the inhabitants of Charvak and Masar-alldi visit it for the fishing, which they carry on by means of canoes hewn out of poplar-stems. Another source of livelihood to the inhabitants of these two places is mining rock-salt in the Tuzluk-tagh (Salt Mountain), the produce of their labour being transported on arbas (carts) in winter when the river is frozen over.

At Yugan-balik, three shepherds' families lived all the year

round in charge of a thousand sheep belonging to merchants of the two towns just mentioned. The animals are shorn twice a year, in the autumn as well as in the spring; and then the owners come and fetch the wool away—the same custom which I observed in the regions beside the Khotan-daria and the Keriya-daria. In this same locality—Yugan-balik—tigers were very common, having increased greatly in numbers of recent years. The year of our visit (1899) they had already carried off five horses and several sheep; but they were shy of human beings, and took very good care not to go anywhere near the sheep-folds.

It was a beautiful afternoon, still and peaceful, and we continued our journey until it grew so dark it was impossible to distinguish the outline of the banks. The air was unusually warm, owing to the veil of fine dust which the gale had brought, and which now hung over the country like a low canopy, preventing excessive evaporation, and even hiding the stars above our heads.

On the 5th October, we drew near to the Chokka-tagh, though only very slowly, for the river had begun to wind about again in the most extraordinary fashion. Sometimes the Chokka-tagh was directly in front of us, and sometimes we had in the same position the Masar-tagh, which we left the day before; but before night, the latter range became shrouded in the dust-haze and disappeared altogether from sight. Both banks were bordered by narrow belts of tender young forest, but behind them, as far as the eye could reach, stretched one unbroken expanse of golden reeds. Owing to the adverse wind we only covered about two-thirds of our usual distance. The wind, as it came sweeping across the ocean of reeds, struck upon me, on my elevated captain's "bridge," with almost the freshness of a sea-breeze.

At Sorun, where we halted till we should get the spell of still weather that usually set in in the afternoon, I received from some shepherds the comforting information that, with the next new moon the wind would drop, and that we should then get still, calm weather, for it always happened so at that season of the year. As, however, the wind continued to blow till a late hour of the night, I decided to encamp where we were, and make an excursion to the Chokka-tagh and the lake of Sorun. The latter, like the Yugan-balik-köll, was fed by the Yarkand-daria. Whenever the river lies at the higher level, the water flows

down naturally into the lake; then, when the surface of the lake rises above the level of the river, the reverse process takes place; but in both cases the connecting stream flows along the same channel. At the time of our visit the Yarkand-daria was the higher of the two, and so much of its flood was drained away by the lake, that, of the 1,897 cubic feet which it had measured at Kurruk-assteh, it now retained only 989 cubic feet. On the other hand, the water was transparent to a depth of 13⅓ inches.

It was a good thing we halted as we did, for on the 6th October it blew a veritable *sarik-buran* (yellow storm) or fierce sand-storm, and the atmosphere became so heavily charged with dust that the Chokka-tagh, although quite close to us, looked like a grey wall all in one and the same vertical plane, without depression or protuberance of any kind. I walked as far as the Tuzluk-tagh and climbed two of its summits to get an idea of our surroundings. In 1895 we travelled along the northern foot of this mountain without seeing the Sorun-köll, though now it lay spread out at our feet like a map, half overgrown with reeds and its shores dotted with solitary poplars.

The view I obtained was indeed so attractive that I resolved to explore the region further, invested as it was with so many memories of my former visit; in all human probability I should never set eyes on it again. But to do this, it would be necessary to stop where we were over the 7th October. And although we had every reason for hastening on, lest we should get frozen fast in the ice before our journey was finished—really I could not resist the temptation.

And sure enough, the next morning it blew just sufficiently to make it difficult to continue our river-journey, yet not too much to spoil a splendid sail across the lakes in the little skiff. As, however, it would be too far to row all the way back, I sent a man off early along the eastern side of Sorun-köll with a bullock arba to bring the boat back.

I used the same vehicle to get her down to the lake; yet, as the shore was shallow, and it consisted of soft mud, we had, all the same, to carry her a good way out. After she was got afloat, it became my turn. Whilst Naser Ahun carried me down on his back, Islam, who was anxious to go with me, splashed along barefooted behind through the ooze.

There was a crisp and steady breeze, and away we went due south, right across the lake, out of one open reach into another.

The kamish (reed) fences were nowhere thick, and as we slipped past each successive promontory, the boat gently brushed against the outermost reeds, without being stopped. All round the shores, however, the reeds formed a pretty continuous ring, especially on the west side, though they also hid several creeks and projecting points and narrow passages, which gave access to the little lakes immediately to the west. The eastern shore was more evenly rounded off by the scree which came down the mountain-side.

The water of the lake was perfectly fresh, and so transparent that we could everywhere see the bottom, with its *Algæ* and decayed reed-stalks. At 11 o'clock in the morning its temperature was 13°.7 C. or 56°.7 Fahr. The greatest depth we sounded was 6½ feet, and in all probability this was also the maximum depth, for we kept mostly in the middle of the lake.

At one place we saw a beautiful sight—a flock of fourteen snow-white swans, sitting the water in their usual proud and stately way; but when we approached them, they rose with a great flapping of wings, and went and settled farther off.

At intervals we caught glimpses of the clayey shore through gaps in the reeds; and small islets, with tamarisks growing on them, and low sand-dunes covered with grass, were not at all uncommon. In the south the lake expanded into a large open sheet of water, shut in by thick beds of reeds. I naturally thought that was the end of the lake; but two of the natives, who had followed us on horseback along the eastern shore, pointed out a natural channel through the reeds connecting with another lake, Chöll-köll (Desert Lake).

Except for a narrow lane of open water some six or ten feet wide, the passage was entirely overgrown with reeds, and so tall and luxuriant were they that they made a sort of fence or wall on both sides. The wind, however, was behind us, and our little skiff cleft her way through with the greatest ease, her yard bending down the rustling reeds as she brushed against them. The channel was on the whole pretty straight; still, it inclined a little first to one side and then to the other, just sufficient to prevent us from seeing very far ahead, so that several times we fancied we had dived into a watery *cul-de-sac.* But no; each time the prospect opened out again, and so on our brave little skiff glided like a swan. All this while the nodding plumes of the reeds which walled in this lacustrine gallery were so far above our heads that they completely hid

from us the crests of the adjacent mountains; and yet we were so close to dry land that we talked the whole way to the horsemen who were guiding us, although we never saw a glimpse of them.

This channel was considerably deeper than the lake itself—namely, as much as 12 feet, and the water a dark blue colour. The breadth also increased gradually; for although (including the reed belts) it was nowhere less than 30 feet, it often widened out to 100, and sometimes to over 150 feet. Several circumstances seemed to point to its having been made by human hands, others that it coincided with an ancient river-bed; yet it was clearly nothing but a natural water-course, kept open by the alternate ebb and flow between the Yarkand-daria and the lake of Chöll-köll.

The whole place swarmed with wild duck. They kept diving and swimming along in front of us, and sometimes, when we got close to them, they swept up in such numbers that the water was churned into foam. Then down they would plunge like a hail-shower, bob under, and come up again, quacking incessantly. Unfortunately, Islam had forgotten to bring his gun with him. We never dreamt there would be such a splendid opportunity as this. At length we approached the Chöll-köll, which was free of reeds. Simultaneously, the wind began to die away. But as I had already mapped its western shore in 1895, there was no object to be gained by sailing across it.

When Islam saw the enormous flocks of wild duck—actual clouds of them—rise, terrified by the appearance of our white sail, and scurry backwards and forwards across the lake, he was unable to contain himself any longer. So I gave him permission to ride back to camp and fetch his gun, as well as to row the boat back through the channel which we had just threaded.

Whilst he was doing that, it suddenly entered my head to walk across the Chokka-tagh, that is eastwards, and then find my way back to camp round its northern extremity. A shepherd of the locality told me the distance was deceptive, the range was further off than it looked, and even after we got over it, we should have as far again to go as the distance we had sailed during the last four and a half hours. But I had made up my mind, and was not to be deterred by his representations. It was a fine opportunity to complete my map

of the region—an opportunity I could not afford to neglect. It was half-past three o'clock, the sun was nearing the top of the Tuzluk-tagh, and it was evident to the simplest understanding, that we could not get back to camp before midnight. And yet get there we must at all costs, else the chronometers would run down.

Hence after dinner, I chose Palta and the shepherd just mentioned to accompany me, and we set off to the east-south-east, making for a notch in the long crest which topped the range. Although we walked at a smart pace, and steered a straight line for the pass, at the end of an hour we did not seem to be any nearer to our goal. At the end of the second hour, however, we approached the foot-hills of the range. Seen from the lake whence we started, these appeared to merge immediately into the main chain itself; but we now perceived that they were parted from it by a long stretch of rising ground.

As we advanced, the features of the country changed. We crossed a series of concentric zones, which girdled the mountains, each different in character from the others. Nearest to the lake lay a strip of low, sterile soil, inundated when the Yarkand-daria was in flood, but at this time covered with a slight sprinkling of salt, a proof that the water of this land-locked lake was not perfectly fresh. Next came a belt of reed-steppe; and after that a zone of older salt deposits (*shor*), now dry and crystallised, and the whole brittle and crunching when trodden upon. Lastly, we came to the slope which mantled the western foot of the chain. Its fall towards the lake was extremely gentle, only 3°, and it was covered with débris, and furrowed by vast numbers of tiny runnels, at this time dry, but interlacing, dividing, and sub-dividing like the arms of a veritable delta. The nearer we approached to the mountains, the more rugged did they grow, until at last the fractured edges were several feet in height, so that we could only make progress by going round them.

At last the ascent grew steeper, and we were forced to stop to catch our breath. From the top of the scree we obtained a splendid view of the lake behind us. It was broader than I thought it was when I saw it, foreshortened, in 1895. Its southern end had in no respect altered, but was broken in the same irregular manner by little bays and marshes as when I last beheld it on 22nd April, 1895. My mind became filled

with sad and solemn thoughts as my eyes fell again upon the steppe where our tent stood that unhallowed day, while away to the south stretched the murderous desert "ocean" in which my caravan perished. There before me lay, peaceful and tranquil, the copious lake, which would have preserved the lives of both men and camels, had we only possessed sufficient foresight to carry with us a larger supply of the water which it wasted by evaporation upon the desert air to no man's profit.

The towering crests of the sand-dunes were now bathed in purple and red, and glowed like burning volcanoes in the setting sun. They were giant graves covering the dead. And as my thoughts penetrated the dread wilderness of sand, where I knew that my servants and camels lay sleeping their last long sleep, my heart was oppressed with uneasiness. Could they forgive me—me, one out of the only three creatures which escaped alive out of that fiery Gehenna—could they forgive me as I stood thus, surrounded by every comfort, and gazed out towards the spot where their tortured spirits were dissociated from their suffering bodies? Did brave old Mohammed Shah, as he now cooled his parched throat under the palm-trees of the heavenly Bihesht—did he perchance urge his accusation against me? For it was indeed I, I who was responsible for that terrible journey through the most deadly and most accursed region on the face of all the earth. I fancied I could hear the murmur of a death-song stealing upon my ear from the heart of the desert, and expected every moment to see the spectres of the poor camels which perished in such unspeakable agony stealing forth from behind the sand-dunes, in search of him who misled them and deceived them, forcing upon them that mad and desperate, that agonising, that utterly hopeless, struggle with death. I remembered as well as if it were only yesterday, how the big tears dropped from their wistful eyes, and were mockingly gulped up by the burning sand. *

The scree, or curtain of débris, was now very uneven, and sparsely dotted over with steppe tamarisks, whose long, stiff needles reminded me of the pine needles of my Northern home. We put up a couple of deer, which in long, elastic leaps fled, light as a dream, up the slopes of the Chokka-tagh, their feet scarce seeming to touch the ground.

After crossing several minor crests, we finally struck into a *yilga* (eroded glen), which led us to the summit of the range.

* See *Through Asia*, vol. I, pp. 519-574.

There we halted a short while, to survey our position and decide in which direction we should continue our journey. The pass on which we stood was about 650 feet above the level of the lake. A precipitous ravine shot down to a plain at its foot, which stretched away as far as the eye could reach to the east-north-east. Immediately to the east were high sand-dunes. The sun set behind Tuzluk-tagh, and it grew rapidly dusk, the dark shades seeming to grow up out of the ground like mist, and once more the pall of night was spread over the desert, the mountains and the lake.

Our next business was to get down on the other side without mishap. The descent was so steep, the men wondered how we were going to manage it. But manage it we did, mostly by slipping, sliding and glissading. In this rapid scramble I found my geological hammer very helpful, for on such excursions as this I always carried it with me. After a while the descent became easier, and we were soon down in the valley; then hastening along it, we reached the spur which shut it in on the left. Beyond that we could just dimly discern a fresh spur to the north. This also we should have to get past, before we could obtain a glimpse of Sai-tagh, a little isolated hill close to the camp, on which our men were to kindle a fire when evening set in.

After walking diagonally across the gravelly scree, for it extended also to this side of the mountain, we came to level ground, covered with sand, where the going was much easier in the dark. Being unaccustomed to such long tramps, I began to feel very tired, and so at the end of every 2,000 paces or so we granted ourselves a five minutes' rest, flinging ourselves down full-length on the cool sand. For I was counting the steps we took, so as to be sure of the distance, as well as to complete the circle, which began and ended at our encampment.

On the left we had the dark silhouette of the mountain; on the right the sandy desert, which even here rose into barren dunes, so high as to be easily mistaken for a spur of the mountains themselves. At length we caught sight of the reflection of a fire, though we could not see the fire itself, owing to an intervening height. Do you know what it means to travel towards a fire on a dark night? When you are tired it encourages you as a beacon of hope; but you can march on and on for hours without getting any nearer to it. At length, however, after going a few thousand more paces we passed

the end of the intervening ridge, and then saw distinctly the fire and its leaping tongues of flame. When the fire drooped, as it sometimes did, the distance seemed to grow as long as ever it was; but when a fresh armful of dry fuel was flung upon it, we fancied we should soon reach the bright flames which we now saw so distinctly. At intervals we stopped and shouted, but as yet got no reply. Finally, however, there came back a faint answering shout, and we knew we were drawing near to our goal.

As soon as my men were sure it was we, they set fire to a row of dead and dried poplars, and an hour later we made our entrance in fine style through the magnificently illuminated forest. There we found two horses waiting for us, and I do not think I ever put leg across a saddle with a more grateful sense of relief. Islam and the other men, who had grown uneasy at our prolonged absence, met us with torches, and so lighted us home across the marshes and rivulets which ran down to the river.

A twenty-four miles' tramp when you are not accustomed to walking is not a bad piece of work. It was midnight when at length I sat down again in my tent and ate my supper; then I wrote up my note-books and diary, and finally crept into bed. Such was the first hard day I spent in the heart of Asia; but it was by no means the last.

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CHAPTER VIII.

RIVER-WINDINGS, WOODS, AND MASARS.

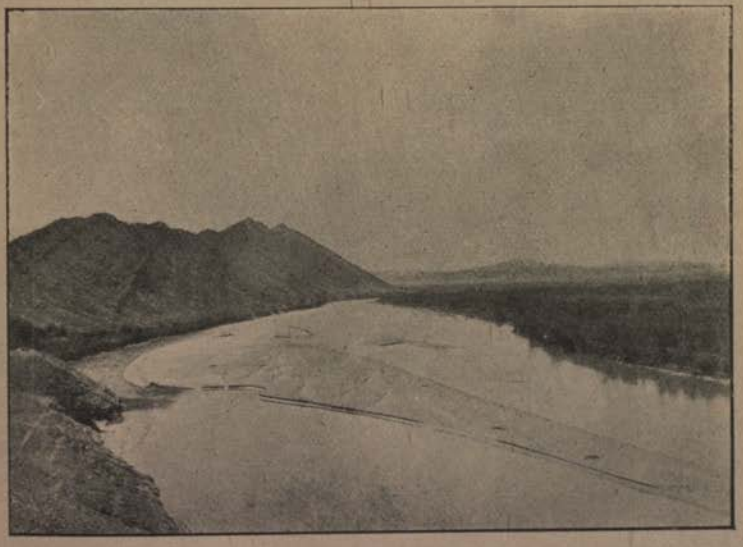
THE 8th of October was a glorious morning, as still as the Sabbath, with a beautifully bright atmosphere, so that the mountains stood out sharply and distinctly down to the smallest feature. Not a dimple on the river, which stretched out before us, sparkling like a mirror, as it lazily dawdled round its long sweeping curves, shut in between its high, sharp-cut banks, with their fringes of cheerful young forests, yellowed by the breath of autumn, and their belts of luxuriant reeds.

Our heavy colossus glided on her way so sedately and so tranquilly that there was very little for the men to do, except give an occasional push when we entered the angles or rounded the curves. Most of them were indeed tired after the exertions of the previous day, and silence and peace reigned on board. Palta lay stretched at full length on the fore-deck exposed to the full blaze of the sun, leaving his punting-pole to young Ibrahim, the son of our new guide, who was simply called the Mollah.

The isolated little hill of Sai-tagh stood close beside the river; in fact, the water washed its foot, swinging in so close to it as to leave room for nothing more than a shepherd's path and two or three young poplars. Its western declivity, which fell at an angle of 34°, was naked rock, though further away from the stream its flanks were carpeted with sand. Towards the north it was continued by a chain of low eminences running parallel to the river. On one of these ridges we perceived a small burial-place, consecrated by its quietude and soothing restfulness. Here our Mollah, who knew his Koran, recited certain prayers, whilst the rest of the men kneeled about him. Its principal monument was a mausoleum of sun-dried brick, cubical in form and surmounted by a cupola (*gumbez*), erected to the memory of some eminent man, probably a highly-honoured

shepherd or hunter, and around it were several other tombs. On the very summit of the ridge were two other graves, without any covering beyond a few pieces of timber and some stones, and with the north end—for they lay north and south—quite open, so that we were able to see the heads of the skeletons which lay within. One of the graves was divided, so as to accommodate two corpses. Neither of the graves appeared to be very old.

At noon a slight breeze sprang up in the south-west, and as we were travelling towards the north-east, we went along at a spanking pace. We encamped for the night on the left



The Yarkand-daria at Sai-tagh.

bank, at a place called Moreh. Here the volume of the river was 886½ cubic feet in the second. At this place I suffered a great loss—my favourite dog Dovlet died. Poor Dovlet! he was excellent company, friendly, cheerful, and full of comical impulses, and I always played with him for a little while every evening. When we left Osh, he was a miserably thin little pup; but under my care he had grown into quite a handsome dog. After he was buried I felt quite lonely and melancholy, and it was several days before I got over his loss, I missed him so.

The morning of the 10th October was bitterly cold. At six o'clock the thermometer registered only 3°.0 C. or 37°.4 Fahr.;

and when we started, the river was as silent as the grave, except for the melancholy croaking of a small colony of ravens. The banks were desolate; although in one spot the sight of tree-trunks and branches blackened by smoke showed that shepherds must once have encamped there. The woods were now almost entirely yellow; their green tints were few and far between.

I discovered I had quite a treasure in my guide, the Mollah; he was a perfect geographical lexicon, and knew inside and out the topography of that almost unknown region. Spectacles on nose and with a big sheet of paper in front of him, he made me a map of it, with every place and route delineated and named; and he showed me at what points the desert approached nearest to the river. I had afterwards several opportunities of testing his map, and found it singularly correct. He had ranged these woods several times when hunting, and had three times been all the way to Shah-yar. With the boatmen he was exceedingly popular, for he entertained them many a long hour with reading, having brought with him two books which described the travels of the earliest Mohammedan missionaries in East Turkestan.

In another little cove we surprised a troop of wild swine, the old ones perfectly black, the young ones, four in number, brown. For a moment they stood gazing in amazement at the huge monster which came floating down the river towards them, then they all turned tail and disappeared into the reeds, going off at a smart trot and all together in a clump.

Towards evening we approached the district of Ak-sattma, where a certain *bai* (rich man), Kurban by name, the owner of 2,000 sheep and a large number of cattle, had built two huts at the foot of a sand-dune, near a few solitary poplars. As he also cultivated wheat and melons, we were able to replenish our stores in a satisfactory way.

Although the day wore late, we decided to round yet one more *chugulup* (loop). The twilight spread itself over the glittering stream, its placid surface as smooth as glass except for a few slight dimples. The evening was so silent, you could hear your own heart beat. I drew forth the musical-box and set Islam to attend to it; and the men, whom I thought it would cheer up, listened silently and reverently. Kasim in the pilot-boat dropped back, so as to keep as near to us as he dared. Sad and melancholy were the strains as the chords of *Cavalleria Rusticana* echoed along the slumbering reaches

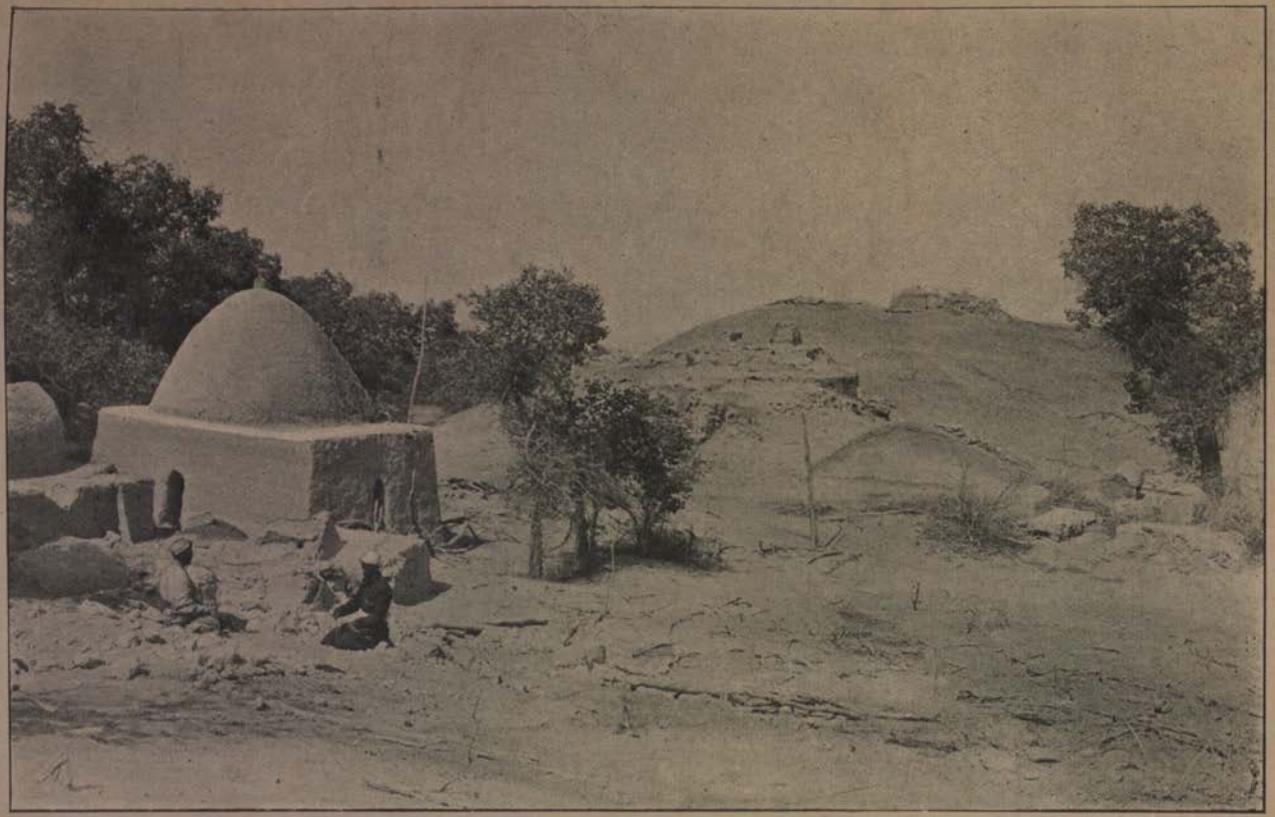
of the river; festal and melodious as the lively measures of *Carmen* vibrated through the forests. Then followed a folk-song, of serious import, to which the wondering woods and waters listened in silent sympathy. But when the echoes of the neighbourhood were awakened by a stirring march, fancy converted our homely ferry-boat into a triumphal barge, making her state entry into some desert capital, to the accompaniment of trumpeters' fanfares and the crash of regimental music. It was a delightful evening, and as peaceful as it was charming. The air was loaded with the scents of the forest, and the fragrance of the meadows and the reed-beds, and a profound silence, as of some holy temple, reigned over all—river, forest, steppe and field. Amid that deep, oceanic silence the smallest sound struck with an exaggerated effect upon the ear. The least movement of bird or beast seemed to fill the air with ringing echoes; a duck swimming in a sheltered nook of the river, a fish splashing in the pitch-black shadow under some high, steep bank, a fox rustling amongst the reeds, even a handful of sand-grains dropping upon the water from some overhanging shelf above the river—all smote upon the solemn stillness of that lovely autumn night in the heart of Turkestan. The shades of night came down upon us fast, whilst we, like spectres and ghosts from another world, drifted on deeper and deeper into the heart of that weird, lone land, the denizens of whose sleeping woods no doubt listened with creeping awe to the changing melodies of our instrument. The strains of a musical-box are not the most noble sounds with which to delight the ear of man; but the surroundings—the time, the scene, the accompanying associations—invested them with a magic charm and effect there was no resisting; while the profound silence around begat in the mind dreams of great and daring deeds that might yet be achieved.

But while we rested for the night amongst the yellowing poplars on the shore, the unslumbering river carried further the great flood of water which had borne us along during the day, and so gave it one day's start of us. It was so late in the evening when I measured the river, that I had to do it by torch-light. The volume was 943 cubic feet in the second.

A slight, moist dew lay over the Yarkand-daria when we started at seven o'clock the next morning, the 11th October. Our course ran at first towards the south, so that the rays of the rising sun, filtering through the mist, caused the figures of

the men, standing in the pioneer ferry-boat and skiff, to throw dark silhouettes against the veiled background of the river. The river still preserved the same characteristics, being every bit as sinuous as heretofore. This, and the strong wind which lay in our teeth, prevented us from travelling very far that day. These eternal windings were enough to make a man dizzy. Sunshine and shadow, wind and shelter alternated incessantly. One while we were freezing; then a little while after the sun was hot enough to scorch us. Now we crawled along slower than the snail, anon we rivalled a race-horse. In the transverse loops the current lost a good deal of its innate force through friction and pressure against the perpendicular banks, but by way of counterbalance it expended its force in other work, namely, in eroding the banks. And experience confirmed this inference, for we always moved slower after passing such spots.

At Moreh, where I lost Dovlet, the men, having run out of *naz* (snuff), sent young Ibraham to the bazaar of Chiggan-chöll to buy a fresh supply. The lad had a fifteen-mile tramp to reach the place, and joined us again two days later at a spot called Duga-jayi-masar. In addition to an armful of melons, carrots, beetroot, onions, and bread, he also brought his mother and younger brothers, so that during the next few days we had fresh passengers on board. At the camp we had just left the banks rose seven feet above the surface of the river, and the ground inside the forest had not yet dried from the summer overflow. That is to say, the river had fallen more than six feet since that happened. The farther we advanced the narrower and deeper grew its bed, and the slower flowed its current. The breadth indeed seldom exceeded 50 feet. As I was getting impatient to reach the Aksu-daria, where the Mollah assured me we should have three times the quantity of water we now had, we generally drifted eleven hours every day. No wonder then I grew stiff and numbed with sitting so many hours bent over my work-table. With the view of getting a little change in this respect, I contrived a sort of lounge of felt rugs and cushions in the skiff, and arranging my writing and drawing materials, and the necessary instruments, conveniently about me, lay there and worked in the lap of comfort. By keeping a good distance ahead of the big ferry-boat, I got away from all disturbing sounds, and, pipe in mouth, pen in hand, and map on knees, I revelled in the solitude and idyllic stillness of the



Burial-place at Sai-tagh.

scene. I cannot conceive an easier or a more comfortable way of travelling through an unknown region.

During the night of the 12th October we had our first touch of frost; the thermometer fell to −1°.1 C. or 30.°0 Fahr. In the evening of that day the river measured 867 cubic feet in the second. The next day the Yarkand-daria wound about worse than it had ever done since the journey began. At the end of three and a half hours we found ourselves abreast of the identically same poplars we had started from first thing in the morning. The day was bleak and raw, and we were glad to get into our furs. While Islam and the Mollah preferred to tramp through the woods, cutting off the winding loops by traversing their bases, the rest of the men crouched on board wrapped in their *chapans* (cloaks), keeping a watchful eye that we did not run aground: they would not relish jumping into the water on such a day. After seven hours we picked up Islam and his companion; they were lying fast asleep beside a dying fire. Out of the seven hours which had elapsed since they left us, they had been waiting no less than five; and had it not been for their fire, we should never have seen them, but have gone past, leaving them fast asleep where they were.

The first nights of frost left their mark upon the forests; the foliage everywhere was now fast turning yellow. The wind scattered the leaves so thickly over the surface of the river, that it became spotted all over with yellow, and our ferry-boat drifted on through a veritable avenue of hanging gold. The movements of the floating leaves showed clearly how the least breath of air influenced the rate at which our craft drifted. Sometimes the leaves travelled faster than we did; sometimes it was we that went the faster; but in a dead calm, we kept equal pace one with the other.

On the evening of the 14th October we encamped in the district of Yiggdelik. The river immediately above that place was unusually straight, and as we had a light breeze behind us, we made good progress. On the right bank, where we stopped, we found in the forest, on the top of a sand-dune planted with tamarisks, a pole erected, to signify that there was a masar or holy man's tomb in the vicinity. Our Mollah had been there several times before, in quest of rubies, which he declared were to be found amongst the sand-polished flints that covered a wide, open stretch of country between the desert and the forest. He said he had spent the night close to the

gumbez (dome) of the grave, and had seen a pale, flickering flame hovering above it. But he was said never to have found any rubies. Towards the south-south-east we perceived the extreme outliers of the "sea of sand," namely, a double-humped dune of gigantic dimensions. I should readily have taken it for a small detached mountain group, had the Mollah not assured me that it was actually built up of sand.

The first part of our journey on the 15th October resembled a tangled cord, but the latter part was quite normal. As a rule, when the river wound greatly, it was also narrow and deep, with a slow current; but when it straightened out it became shallow and broad, with a swift current, in other words the fall was here greater. Sometimes it seemed as though the river did not know which way to turn, but paused to consider, wondering whether it had not better stop for good and all. Already the thermometer reached a minimum of −4°.1 C. or 24°.6 Fahr.

My boatmen now began to lose heart a little, as we thus went on day after day, getting further and further away from their homes and hearths in Lailik, and penetrating ever deeper into unknown deserts and unknown woods. But their courage revived again after we reached Kuilushning-bashi; for there a fine fellow named Yussup Do Beg, who was grazing his sheep in the vicinity, comforted them with the assurance that when their task was finished it would be the easiest thing in the world for them to return home again by the great caravan-road through Aksu. By this the first of the jighits, or couriers, who was to bring my letters from Kashgar, was, or ought to be, on his way to Dural. I arranged, therefore, with Yussup to have him stopped at Aksu, and sent on from there down the river to meet us, or rather to wait for us; which he did.

On the 17th October we struck one of the deltaic arms of the Kodai-daria, but it contributed only an insignificant increment to our current, a thing not indeed to be wondered at, seeing we had already found it dry at the point where it broke away from the main stream. Of course that might be, and yet there might be water still remaining in the river lower down. For some distance after this the Yarkand-daria flowed due north, and we did not lose anything like so much time in winding in and out of its sinuosities. Yet for all that we traversed one which described as nearly as possible a complete circle, the chord of its arc being only forty yards long. The next time the river

was in full flood it would infallibly break through that narrow neck of land, and so cut off the loop. The banks were here 11 to 13 feet high, and were being undermined at each end, so that the neck was already rapidly growing narrower. In this part of the river, similar abandoned loops or back-waters (*boljemal*) were pretty common. In almost every case there remained in them a little crescentic pool (*köl*) of clear water.

A Shepherd Bringing us a Sheep.

At a point on the right bank where there was an abundance of thickets and dead forest we perceived a column of smoke curling upwards amongst the trees, followed soon afterwards by leaping tongues of flame. The Mollah said they were fires made by the shepherds to scare tigers and wolves away from their flocks. During the past few days we had several times seen traces of tigers on the banks. And true enough, when we came abreast of the place, behold there were two or three shepherds; but the moment they caught sight of our ferry-boat, with its white spectral tent and pitch-black hut, they took to their heels and fled as if the Foul Fiend were after them, abandoning

sheep and dogs and fires to their fate. We shouted, we sent messengers after them; but no, they were gone, and we never set eyes on them again. For this I was sorry; I wanted to get some information about the district.

The tendency which the river here showed to straighten its course by cutting off its loops was due to the conformation of the surface. This consisted of loose sand, which crumbled down at the least touch, so that the river was able to carry on its work of erosion without any particular difficulty. And it was a necessary consequence of the variability of the river's course that the forests thereabouts were thin, and had seldom grown to any great age. It was no uncommon sight to see the poplars standing on the very verge of the river, ready to topple in the moment the current should have undermined them sufficiently; indeed, many of them lay already prone on the water, merely held precariously by their roots. The volume of the stream had by this diminished to 716 cubic feet in the second. But the transparency had decreased from 15½ inches, which it registered only a little way back, to 8 inches. This again was a consequence of the loose and porous character of the containing soil.

On the 18th October the wind was again contrary. When our course lay due north, it blew from that quarter; and when we turned towards the north-east, the wind also changed and met us again; but eventually it fixed itself in the east. The river-bed was tolerably open and flat, so that we got little protection from the banks and the belts of vegetation which accompanied them. On the windward side the tent-canvas was as taut as a drum, and by putting our hands upon it we obtained some idea of the force with which the wind was driving our craft to leeward. The men had to work hard all day long to keep us clear of the banks; indeed, so hard were they put to it that they had great difficulty in finding time to eat their frugal breakfast of bread and melons. The bosom of the river was more encumbered than usual with drift-wood, branches, snags, and flotsam of all kinds, loosened from the shallows and banks in which it had been fastened. The sky was heavy with clouds, and the wind whistled shrilly through the thin and stunted poplars. The volume increased again to 788 cubic feet in the second. As soon as I had finished my measurements, I took a stroll through the forest, followed by Yolldash; but before I got very far the forest proper came to an end, or

rather it passed over into bushes, steppes, and finally the outermost fringe of the desert.

The next day the wind was again a serious hindrance to us, especially after it quickened into a tempest on a small scale. The atmosphere was thick with drift-sand, so that all we could see of the sun above our heads was a faint yellowish-red blurr. It was impossible to see where we were going to, the banks became swallowed up in the haze even when quite close to us, and the wind howled and shrieked through the young forest trees, tossing the hard, dry, rattling leaves about their ears, like a bull in a hay-field. At the inner angle of the sharper loops, where the counter current set up a sort of eddy, there were immense accumulations of fallen leaves, putting me in mind of miniature sargasso seas. Round and round they swirled in a densely-caked mass, swinging off at their extreme outer edge in a long, trailing tail, which gradually found its way back into the main current, where the leaves once more danced along until they were caught in the next eddy.

For some hours we struggled on against the gale, and were just on the point of stopping, when the Mollah declared that, if we would only have patience for one hour longer, the river would bend round to the south. And he was right; it did. And then, oh, what a change! On we flew before the wind, the banks swept past us like railway-trains, the water hissed off our bow. But it was too good to last; the river soon turned again, and once more pursued its favourite direction towards the north-east. But upon reaching a sheltered nook we pulled up and rested some hours.

After the wind slackened a bit we continued our journey. Then about twilight it dropped altogether, and as the moon came out, and converted the smooth river into a silvery highway, pointing straight towards the east, we resolved to push on still further by moonlight. I had my photographic developing-lamp lighted, so that I might be able to see the compass, chronometer, and map, without having my eyes blinded to the features of the moon-lit landscape before me. The boatmen, hovering between the faint reflection of the red light behind them and the pale blue light immediately in front of them, assumed quite a fantastic appearance, their dark silhouettes being etched with almost unearthly sharpness upon the mirk and glittering river where the moonbeams played. The banks loomed up dim and solemn against the sky on each side of us, as though they were

sketched upon the landscape with the blackest of graphite ; and it was only very occasionally that a quivering rod of moonlight struggled through the intense blackness of the poplar-woods. The beauty of this scene at night, in the heart of the Asiatic solitudes, was to some extent lost upon those of the men who had to jump overboard into the river and push us off whenever we came rather too sharply into collision with the banks, as we did once or twice.

It was quite late at night when we at last stopped beside the Yekkenlik-köll, where there was an abundance of excellent fire-wood. As soon as we got a good fire started, we flung across it four whole poplar-trunks ; and as they crackled and spluttered, their vivid flames lit up the silent woods for a wide distance round, and penetrated into their deepest recesses, unveiling their mysterious secrets, and laying them bare to the cold eye of night. When, early the next morning, we pushed off from the camp, there was nothing left of the massive logs except a heap of grey smouldering ashes.

On the 20th October the bed of the Yarkand-daria continued to exhibit the same characteristic features with a truly wonderful uniformity—the same formations, the same types of curve and winding, the same sharp angles, eddies, and sandbanks as heretofore, each successively cast in precisely the same mould as its predecessors. A lace pattern could not have shown a more persistent uniformity. The banks or river terraces were 16 to 20 feet high, and very often our 20-foot punting poles were not long enough to reach to the bottom. The surface of the river was now literally patterned with leaves, which lay as thick upon it as ever they did around the forest-monastery of Vallombrosa ; and in the whirling pools where the river turned, the reed-stems writhed like snakes amongst their swirling masses.

When we came to the Masar Khojam, which stood a little way back from the river, we left Kader behind to keep watch upon the boats, and all went to visit it. The tomb commemorated the memory of a saint named Hazrett-i-Akhtam Rezi Allahu Anhu, who lived in these regions in the time of the Prophet. It consisted of a few dry clay mounds of a greyish yellow colour, surmounted by stakes bearing bunting and antelope skulls, the whole enclosed by a fence of brushwood, to prevent the sheep and cattle from profaning the sanctity of the place. On the south side it was flanked by a very primitive *khanekah*, or prayer-house, consisting of a few vertical posts covered with a

simple roof, and on the east by an *ayvan*, or verandah, supported by two pillars. The building was 10 feet high and over 35 feet long, and was surrounded by a fenced-in court-yard, to which access was gained by an entrance-gate. A few gnarled and aged poplars grew in the vicinity.

The Mussulmans paid their devotions at the shrine by holding a long service, in the course of which the Mollah's deep, strong voice, reciting *Allahu ekbar!* resounded through the brooding stillness of the forest. And it cannot be denied that there was something touchingly solemn in their worship. We were engulfed by an earnest silence as of the open sea. Nothing stirred, nothing moved, except the drowsy leaves, which, touched by the faintest breath of the breeze that came through the lips of the forest, shivered as they still hung precariously by their now brittle stalks. It would be impossible to find a more peaceful place for a shrine—far away from the noisy haunts of traffickers and beside a lonely river, which was now for the first time being navigated by man. Not a sound fretted the noontide hush of the forest, except that a shy hare slipped away as we drew nigh. "La illaha el-Allah!" echoed the deep voice of the Mollah, full of earnestness and conviction, and the sound travelled a long way through the motionless poplars. The saint's memory is celebrated on a day towards the end of November by the inhabitants of Avvat, who betake themselves to his shrine in great numbers, and stay there three days, carrying provisions with them and encamping in the forest. Masar Khojam would be just the place for a hermit.

The name of our next camping place, Kalmak-kum (Sand of the Kalmucks or Mongols), proved that some time or other in the far distant past Mongols had dwelt beside this river. There we found three shepherds, with their families and some 300 sheep. My curiosity was excited by a peculiar contrivance (*tor*) they had for trapping birds of prey. It consisted of four flexible rods, stuck into the ground at the corners of a square, and bent inwards so as to hold open a sack-like net, with a hole in the middle. Immediately below the hole the hen or pigeon was tied which served as bait. As soon as the hawk tried to fly off with his booty, the elastic rods sprang apart, drawing together the opening of the sack, and in that way he was caught.

The volume of the river again dropped very considerably, only measuring 593 cubic feet in the second. The prospects of success once more began to darken.

CHAPTER IX.

THE LONELY TARIM.

THE 22nd October was quite a red-letter day in our journey, for we had the straightest piece of the river we had hitherto met with. There was only one place which occasioned us any difficulty whatever, and that was caused by the bifurcation of the stream. We chose the shorter arm, although it was considerably the smaller, and choked with drift-wood and lumber; but it turned out in places so shallow that we were forced to haul our ferry-boat after us. The temperature of the water had fallen to 10° C. or 50° Fahr., so that I had no longer any inclination for a swim. Kasim, however, held different views as to the utility of a bath; for whilst standing on the stern of the pioneer-boat, pushing it along in the usual way, he over-reached himself, and fell backwards into the river, to the unspeakable amusement of his fellow-boatmen.

Our broad highway now stretched on a long way ahead, until it disappeared in the far distance. To the eye it wore the appearance of a succession of black and white horizontal reaches, the former being the sand-banks and alluvial deposits, the latter (the white patches) the stretches of open water foreshortened.

The following day's journey, although short, brought a good deal of diversity, and compelled the men to keep their eyes well open all the time. As we drew nearer to Avvat, the shepherds increased in number, and their huts stood at pretty close intervals on both banks of the river. During the course of the day we passed the point where the Kashgar-daria (our old friend the Kizil-su) entered the Yarkand-daria by two narrow mouths, both of them for the most part choked with sand and mud and vegetation. The two together brought but a slight increase in the volume of water.

Not long after we started in the morning we perceived a horseman on the bank. No sooner did he catch sight of our flotilla than off he went and disappeared behind the bushes. He was evidently a scout sent to keep a look-out for our coming; and very soon afterwards we saw a troop of horsemen riding towards the river. They dismounted, spread carpets on the ground, and offered us *dastarkhan* of grapes, melons and bread. It turned out to be the *yoll-beghi* or road commis-

A Hunting Eagle.

sioner of Yanghi-Avvat, who had been sent to welcome us. After a short rest, we continued our journey, taking the commissioner on board with us, whilst his retinue accompanied us on the left bank.

About an hour later, behold! another band of horsemen, dressed in gay-coloured khalats, two or three of them evidently men of some distinction, and again we had to stop and partake of *dastarkhan*. This was the principal *bai* (rich man) of the Andijanliks (West Turkestan merchants) of Avvat. Him also we received on board, whilst the rest of his company rode beside

us on the right. Thus we were escorted by a cavalcade on each bank; while Islam Bai on board did the honours with tea round the fire-place on the after-deck.

A little bit further on, a third body of horsemen were awaiting us on a projecting headland, which they had almost covered with various fruits, eggs, bread, and a whole slaughtered sheep. This was no other than the beg or governor of Avvat, who desired to offer us welcome in his own august person. He also came and joined the company on the after-deck, which was thus getting quite populous. What with this and the successive clusters of mounted men riding along the banks, I warrant the turbid waters of the Yarkand-daria had never in all their history witnessed a more magnificent or more imposing spectacle. Amongst the horsemen were eight falconers, two of whom carried eagles, the others falcons, all duly hooded. In this part of the world falconers form an indispensable adjunct in any formal parade or procession. Later in the day they gave us an exhibition (*tamashah*) of their birds' powers, by letting them kill four hares and a deer, all of which were presented to me.

When we came to the village of Mattan we found all its inhabitants assembled on the bank, and a little beyond there we halted for the night. The bank was so steep we had to cut steps in it to get up on *terra firma*. There we rested a whole day. Yet the time was not wasted; for I spent it in developing photographic plates, in determining the astronomical position of the place, in measuring the volume of the river, which I found to be 657 cubic feet, and in gathering information about that region generally, and about the river in particular, below the confluence of the Aksu-daria. I was told there were no hindrances down to that point, and beyond it we should find a flood, which would carry us along at a glorious pace.

After duly rewarding everybody for their services, and the beg had found for us a fresh hunter well acquainted with the country, besides a new dog called Hamrah, we plunged once more, on the 25th October, into the wilderness. The river-bed was broad and flat, but sharply defined, being inclosed between banks nine feet in height, with steeply-scarped sides, showing that they marked the extreme compass of the river when in full flood. But the actual stream, now shrunk to a mere ribbon, meandered to and fro from the one bank to the other, threading the sand-banks and alluvial deposits with

which it was so thickly beset. Being shallow, it moved slowly, and was frequently divided by islands of silt. Once we took the wrong arm, and were forced to turn back, which cost us a couple of hours of valuable time. The current had now shrunk to a miserable 505 cubic feet in the second. But from the indications on the banks it was plain the river had, during that same summer, been 4½ or 5 feet higher; in other words, the flood must have attained unprecedented dimensions.

One thing, however, was in our favour—namely, in October the river usually rises again for a short time. This we were told in Mattan, and the event proved the information to be correct. The reason of this apparent anomaly is, that as water is then no longer required for irrigation higher up the river's course, the innumerable ariks and irrigation canals begin, often through the medium of springs, to restore their contents to the river from which they originally derived them, and the consequence is the stream slowly rises. On the 26th October, the volume had increased nearly 100 cubic feet—that is to say, it measured 601 cubic feet.

The 27th October was a notable day; we knew that before its close we should reach the long-hoped-for confluence of the Aksu-daria. It was a glorious autumn morning, still and peaceful, and the river glittered like a mirror, and every bush and tree was reflected on its surface with such distinctness that we had to keep lifting our eyes to the banks to distinguish the image from the reality.

The forests hereabouts were not old; all the poplars were young trees. On the other hand, there was an abundance of tamarisks and other bushes.

We were now all agog to catch the first glimpse of the big tributary, which the men of Lailik had never seen, but only heard speak of, so that they approached it with a certain amount of curiosity. "Look! when you get past those poplars—then you'll see it!" declared the Mollah; and when he proved to be wrong, he repeated his assertion, that it would be behind the next bend. Evidently he was not so well acquainted with this part of the river as he was higher up.

Meanwhile, the velocity of the current was decreasing, and at last it moved so slowly we were forced to use our punting-poles. And as the men pushed and punted they sang together in unison. Once Alim's pole stuck fast in the bottom, while the boat went on without it. But he was not to be put out by

such a small matter; flinging off his clothes, he jumped in, swam to the pole, tugged it out, and then swam back to the boat with it. Yet the temperature of the water was only 9°.0 C. or 48°.2 Fahr.

In the afternoon there was a dead calm, and it grew as hot as on a summer's day, so that I took off my coat, and sat and worked in my shirt-sleeves, sniffing the fragrance of the dishes of apricots, grapes and pears which lay on a carpet at my feet. Two more hours, and the river opened out before us, and there was the noble Aksu-daria in all its majesty. "Voi! Voi!" cried the men of Lailik, as they gazed with rivetted eyes upon the mighty stream. "And are we to venture out upon that heaving flood?" they asked.

Curiously enough, immediately above the confluence the Yarkand-daria suddenly changed its direction towards the north-west. Then it was joined by the Aksu-daria, which came from the north-north-west, and the united stream assumed an easterly direction. From this point the river assumed the name of the Tarim; although it was likewise known as the Yarkand-daria as far as the Lop country. So far as the direction of the conjoint river was concerned, it was the Aksu which exercised the preponderating influence; and from what the natives told me, it must, at all seasons of the year, be the more powerful stream of the two.

Leaving the last projecting point of the Yarkand-daria on our right, we now crossed over to the left bank. During the last hundred yards or so the current of the Yarkand-daria had not only ceased to move, it was in some places even turned back, owing to the more powerful pressure of the Aksu-daria. We came within an ace of being caught in one of these back-flows; but just in the nick of time the men managed to get on shore and moor the boat, otherwise we should infallibly have been swept into the vortex. It was my purpose to halt here at the confluence of these two rivers—Yarkand-darianing-kuilyshi—to investigate the channel more minutely before proceeding further.

I utilized the holiday for various purposes. Amongst other things, I determined the astronomical position of the confluence; developed and copied negatives, and took others; and made an excursion in the skiff to sound the most convenient channel for our elephantine craft, a task which occupied me until long after midnight. The water in the big river was very turbid

Our Landing at the Confluence of the Aksu-daria.

as compared with that of the Yarkand-daria, which had gradually cleared as a consequence of its long, slow fall. Vast flocks of wild geese, all ordered in wedge-like battalions, perfectly marvellous in their regularity and "dressing," flew overhead, with a few skirmishers thrown out between the compacter masses. The long journeys which these sagacious creatures make, all the way from Lop-nor *viâ* the Yarkand-daria to India, have always excited in me the utmost admiration and wonder. They flew at an altitude of 600 or 700 feet above the earth, and kept up an incessant screaming as they flew. There seemed that day to be no end to them. No sooner had one battalion dwindled to a mere speck on the verge of the horizon, than up there hurtled another, all from the east, and all screaming vociferously. Perhaps they are like the rain-water that falls in the mountains, impelled by some imperious power which Nature has implanted in them and which they are constrained to obey like automata. But I prefer to think that the meaning of their incessant "snattering" is that they are discussing the route they should pursue, and where the next resting-place is to be, and what the dangers are which threaten them. Anyway, I always followed them with yearning eyes, as on unwearied wing they soared on and on, high up above the trials of earthly life.

When, on the morning of the 29th, we pushed off from land, the boatmen's "Bismillah!" rang out with greater emphasis than usual, and each man stood at his post with muscles strained and knuckles whitening under the resolute grip with which he held his punting-pole. However, it was not so dangerous as they imagined. It is true our craft was seized in a sort of eddy, and given a good spin; but after that, she proceeded on her way as sedately as heretofore. At first the velocity was as much as $2\frac{3}{4}$ miles an hour, but later on it decreased. The river-bed, however, made such a wide gap in the earth, and its steep banks were so far apart, that the woods which lined them looked like mere black lines on the horizon.

Not long after we started we came to the ferry where the great highway between Khotan and Aksu crossed the Tarim by means of a boat, which was capable of carrying over six camels at once.

In the evening a flock of wild geese dropped into the river a short distance from our camp. They chattered and ducked and splashed, till the air rang again with their hubbub. But

when we arose next morning they were already gone, except one solitary bird, which, exhausted by the fatigues of the journey, had lingered behind ; but it, too, rose, and flying low and screaming anxiously, struggled on westwards in the track of its companions.

At several places along the steeply-scarped banks we observed traps for catching fish. They consisted of a sack-like net or big basket, into which the fish were drawn by means of a long enclosure or passage made of rods stuck vertically into the river-bottom.

The next day the river was wonderfully straight ; not one of its angles was as sharp as 90°, but all were obtuse and elongated. Hence the fair-way was very little longer than the track which ran along its left bank to Shah-yar. The latter crossed on its way a narrow belt of sand, called Kizil-kum, the dunes of which were visible from the river.

Shortly before twilight came on, I began to keep a sharp look-out to my right—that is to say, to the south—so as not to go past the mouth of the Khotan-daria without observing it. At length a wide gap showed itself in the young forest, and through it ran a broad river-bed, five or six feet above the level of the Aksu-daria, and now perfectly dry and deserted. During the short season in which the Khotan-daria does carry water, it is said to swell to a really large river ; and this seemed to be borne out by facts, for the Tarim, just below its confluence, was considerably broader, and there was also a much larger deposit of alluvium. The direction of the main river was however in no sense influenced by its affluent. The latter again called to my mind my ill-omened journey across the desert in 1895 ; but I looked upon the Khotan-daria as a friend that had once saved my life.

The country thereabouts was flat and open, and very uniform. All its features were moulded on the grand scale. The water surfaces were wide-spread, the alluvial formations exceptionally extensive, the river-banks more than half-a-mile apart, and the forests so far distant from the middle of the Tarim that we had much ado to hear the noontide breeze as it swept through their poplars. In the immediate vicinity of the banks the region consisted of kamish (reed) steppes, intermingled with tamarisks, tussock grass, and scrub, with only a very occasional group of aged poplars.

The boatmen were in good heart, and observed with the

greatest interest the new world which was unrolling itself before their eyes. The yoll-beghi accompanied us, and as he sat in front of my tent he plied me with valuable information about the locality, the names of the topographical features, the shepherds, the villages, the variations in the volume of the river at the different seasons of the year. Our new dog, Hamrah, was gradually reconciling himself to his fate, and making himself at home. He condescended to honour Yolldash with his company at meal times, but would not yet condescend to play with him. One of the cocks had learned to come and sit on the ridge-pole of my tent to crow, and the hens often paid a visit to the big ferry-boat, where they wandered about as they pleased, picking up what they could.

The boat glided so swiftly down the broad highway of the mighty river, that it was a good way on into the night when we stopped, though it was not without difficulty we did so, beside a precipitous bank. Whilst the boatmen were sitting round the fire their loud and animated conversation became blended with peculiar sounds from the forest. In answer to my inquiry, they told me it was a vixen's whelps which had lost their mother and were now seeking for her.

The instruments showed that we had here a volume of 2,797 cubic feet, but that the depth was less than in the lower course of the Yarkand-daria—namely, barely over 6½ feet.

On the morning of the 31st October, the surface of the river was slightly crumpled; but we put off and once more drifted away down the great and lonely Tarim. But before we got very far from the silted reed-beds, where we had stopped for the night, the wind freshened, and within a short time it was blowing an uncommonly stiff gale. I was wearing proper winter attire—furs, felts, and felt-boots—but was soon chilled to the bone by that treacherous wind, which drove straight into the tent, threatening to tear the canvas loose and waft it away like a balloon. My fingers became stiff and numb, and I could not use my pen with the precision I desired; I had to get up every now and then and rub them, as well as stamp to keep myself warm generally. Owing to the broad and open character of the river, the wind swept along it with unmitigated force. Yesterday the water was as smooth as glass; to-day it was churned into foam-crested waves, which struck against the prow of our big craft with such violence that they made the old hulk shiver from end to end. Both banks were

enveloped in a yellowish-grey mist, a smoke of fine dust, which the wind scooped up from the earth. As the tent threatened to go altogether, and as the stream, powerful though it was, made no headway against the wind, I commanded a halt, although we had only been travelling a couple of hours.

As soon as we had effected a landing, and made a fire and warmed ourselves, I hoisted sail on my little English skiff, and, to the amazement of the Lailik boatmen, went spinning back along the way we had come. And brave little thing that she was, she literally flew like a bird; the worst gusts seemed to lift her so that her keel just skimmed along the surface. I went over a sandy shallow as though it were nothing at all. The mast creaked, the steering-oar was strained; but it was perfectly glorious to be driving through the sublime solitudes of Asia before the fierceness of that uncurbed tempest. The ferry-boat was soon lost to sight behind a projecting headland. There were none to bear me company except the hissing waves and the yellowing woods and the unloosed fury of the wind. A feeling of supreme content came over me. I felt as though the unbounded spaces of the desert belonged to me, and as though, despite Chinese mandarins and Turkestan begs, I could order everything as I pleased. The wind whispered into my ears that that mighty river had flowed on and on, century after century, for thousands of years, waiting for me to come and wrest from it its dearest secrets; that it was a Higher Will which bade the Tarim wind its smooth highway through the desert, and so offer me an easy passage to the hidden heart of that vast continent. Who was there to dispute with me the ownership of that entrancing stream? The shepherds, may be, who pastured their flocks along its banks, and fled like frightened antelopes when we shot noiselessly upon their sight from behind a jutting headland. Who was there to stop us and demand from us toll and pass? The tigers, maybe, whose emerald green eyes gleamed out upon us at night from among the leaves of the dark tamarisk thickets. No man knew the river better than I did. The native hunters, the half-civilized children of the wild woods, whom we picked up one day and dropped the next as soon as their topographical knowledge came to an end—perhaps they knew better? Nay, not so. Their knowledge only extended as far as they were wont to range in their hunting excursions in pursuit of the flying deer; but beyond the well-known land-marks all was guess-

work. They knew neither where the great river came from, nor whither it was carrying its never-ending flood. I, on the contrary, gathered into my diary everything that the natives knew about it. I lived with the restlessly changing river, mile by mile, and yard by yard; every evening I felt its pulse and took the measure of its life-blood in feet and inches; and though I knew that the river which had flowed on there for thousands of years was always the self-same river, yet I also knew that from time to time it changed its bed, as well as that, after it had hurried on to its dissolution in the far-distant Lop-nor, it was nevertheless destined to rise again transformed, and so repeat again and again its periodic circulation between heaven and earth and earth and heaven. I was as it were the archives in which the life-history of the Tarim was deposited in word, picture, and map, and not one day passed without that material being augmented, growing slowly into a monograph on one of the greatest of Asiatic rivers, of which these chapters give but a small portion.

When you are flying along before such a wind as that you are apt to be forgetful of the rapidly increasing distance behind you. At length, however, I did awaken from my dreams. Steering in towards the nearest bank, I drew my boat ashore and made her fast, and then, penetrating a little way into the forest, I made a fire and ate the *déjeuner* I had brought with me.

As I drifted slowly back with the current, my thoughts ran upon the immediate future, which presented itself before me in the brightest colours. What experiences destiny had in store for me, I knew not; but one thing I did know, that if an enterprise is to succeed it must be planned with prudence and foresight. And as I thus thought, a host of questions pressed in upon me. Should I get through with my purpose before the winter set in? Where should I establish my standing camp, which was to serve as a base for the various expeditions I had in view? Would the jighits succeed in finding me? Would it be good news they would bring me from home?

I got back on board, and set to work to copy negatives. As a matter of precaution I wanted to have two prints of every photograph I took, as well as two copies of the notes and other observations I made. For example, during the day I jotted down my observations with pencil, in small pocket-books, and then copied them out again in the evening into my diary in ink. As for the sheets of my map, I copied them over again as I went

along, in the intervals between recording the successive compass-bearings. All this, of course, caused me a great deal of extra labour, but at the same time it inspired me with a feeling of confidence; one set of my work would surely get home safely.

The only thing which sorely tried my patience was the wind, or rather the fact that the wind was so often against us. On the 1st of November the river turned to the north, and—the wind, too, blew from the north. All day long the tent sheltered me, although the sun would now have been very welcome, for even with a temperature of 10° C. or 50° Fahr. in the afternoon, the air was decidedly raw and cold. During the night, however, the thermometer dropped to −8°.8 C. or 16°.2 Fahr., and the water which stood beside my bed, as well as the ink in my inkstand, was frozen, and oh! it made me shiver to creep in between the icy sheets. It would, of course, have been a simple thing to have put a stove in the tent, but I held off from it as long as I possibly could, I did not want to disturb the self-registering instruments.

At a place called Dolan-kemizi we found an unwieldy little ferry-boat, built of poplar-trunks and steered by a broad-bladed oar over the stern. But no sooner did the ferry-man, who lived in a hut on the bank, catch sight of us than he took to his heels and ran off as fast as he could put foot to ground. Three bais who lived in that part of the country owned between them no less than 10,000 sheep, and the ferry-boat was for the purpose of conveying the animals and their wool across the Tarim.

When we came to the district of Kara-tograk, the river shallowed, and was churned into foam as it plunged down the successive ledges, that were formed in its bed. Here we raced along at a dizzy rate, and were making straight for a projecting headland, where a violent collision seemed inevitable, when we were saved by the current itself swerving to one side, so that we merely grazed the branches of some tamarisks which hung out over the stream. It was a near thing, and I was not sorry to see the bank receding behind us, as we swung off towards the middle of the Tarim.

Immediately adjacent to the river the banks were overgrown with reeds, and a little way back from them, and parallel to them, ran a belt of poplars. Below Kara-tograk the Tarim straightened its course in a way it had never hitherto done;

for it stretched away towards the north-north-east in an almost imperceptible curve, framed in on both sides by yellow lines of reed-beds; while in the far-off distance it seemed to blend with the sky and spread out its waters through all the immeasurable spaces of the world.

During the past few days we had observed that the river rose a little; this was due, as I have already explained, to the re-opening of the ariks and irrigation canals. In two or three places the sand-dunes advanced quite close to the bank, and then broke off abruptly almost as it were hanging over the water. Here it was possible to see with what fierce energy the powerful current undermined them, as one huge avalanche of sand after another was precipitated into the flood below. In those places where the banks consisted of clay, they were not only often perfectly vertical, but sometimes even hung over the water. Once, just as we were skirting one of these impending eaves of clay, the mass broke off and soused plump into the river, drenching the whole of that side of our boat, and setting up such a succession of waves that the heavy colossus fairly rocked on her keel. Again and again we heard what sounded like the booming of heavy guns from some distant fortress; it was these clay avalanches taking their final plunge into the torrent below.

At Leshlik, where we encamped that evening, the boatmen amused themselves with a comical spectacle or game. Two of them took each a companion on his back. The hands and feet of the rider were tied, while the man who carried him took a stick and began to dust away as hard as he could on the back of the opposing cavalier. The riders, bound and helpless, grew angry, and began to abuse one another, each egging on his bearer to give his opponent what for. This exhortation they, nothing loth, zealously strove to fulfil; and when one of them managed to get a good opportunity, his stick went like lightning. Whereupon the victim eagerly called upon *his* walloper to go in and give him (the rider) his revenge. And so they went at it, first one and then the other, until the two riders both got their jackets thoroughly well dusted. Now Palta and Naser were the "steeds," while Kasim and Alim acted the part of riders, and consequently it was their garments upon which these delicate attentions were bestowed. The former laughed until the tears came into their eyes; while Kasim and Alim howled with rage. As for the onlookers, of whom I

was one, we literally split our sides with laughter. Kasim and Alim, wishing to have their revenge, proposed to exchange places with their "steeds," and try the game again. But the other two men objected; they had laid on in pretty good earnest, and they no doubt thought that, in this case at any rate, it was better to give than to receive. The game brought, however, one advantage with it; it thoroughly warmed all who participated in it; and in the light of our big red-blazing fire the figures of the men and their ludicrous motions were highly comical to look at.

CHAPTER X

FIRST SIGNS OF WINTER.

THE temperature of both air and water was slowly but steadily falling; clearly the day was not very far distant when we should find ice drifting on the surface of the river. On the banks, the moist places which had been recently flooded were already frozen hard in the morning, though they thawed again during the course of the day. The cold, however, in no way affected the crew in the after-part of the ferry-boat. They used to make up a big fire and sit round it in their new sheepskin coats, and gossip, tell tales, listen to Kader as he read to them, and bake their bread. The boatmen also took turns in going there to warm themselves; but it was only when we came to a long, straight stretch of river that I was able to leave my writing-table and follow their example.

In the still, cold morning air, when sounds rang out sharply and travelled a long way over the water, we heard what seemed like whole rows of houses being pulled down; but it was only the avalanches of sand and silt, which, after freezing during the night, now became loosened as they thawed, and tumbled headlong into the river. We went along at a glorious pace, leaving the banks rapidly behind us, while small cataracts became more and more frequent.

Kasim as usual led the way in the smaller ferry-boat, and kept constantly calling back to warn us of shallows, snags, tottering avalanches of sand or silt or clay—everything, in fact, which seemed likely to cause us trouble. Palta was the navigating lieutenant of the other ferry-boat. He was always cool and collected, and never lost his good humour, except when some manœuvre had to be hurriedly carried out to avoid a collision, and then he bellowed like a bull of Bashan at his mates on the after-deck. The other men placed the most

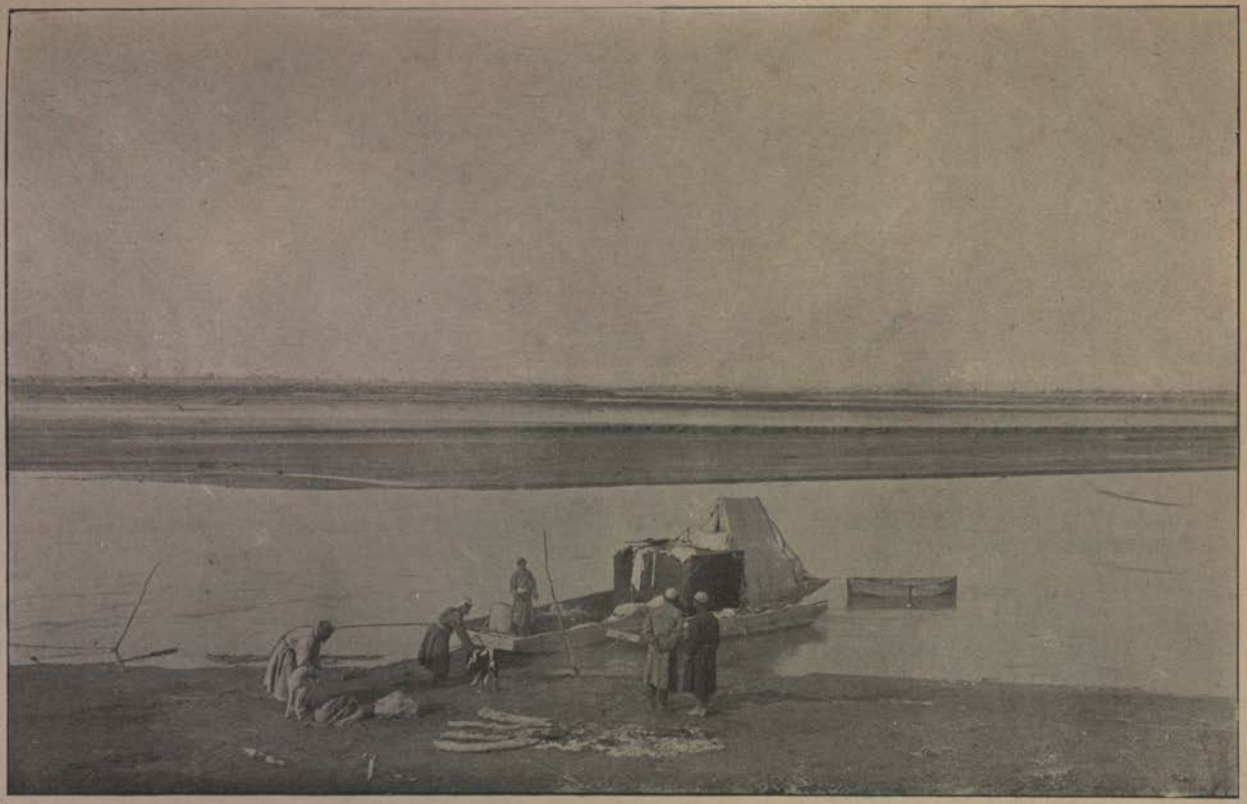
implicit reliance upon his skill, because for several years past he had had charge of the ferry between Lailik and Merket.

But this day none of them got any rest; the Tarim swept along so fast that every man had to be constantly at his post, his eyes intent upon the river and his punting-pole in his hand, ready for any emergency. Only once, however, did they fail; that was in a sharp elbow, where the current took the bit between its teeth and drove in straight upon the steep, high bank. In such cases the crew were wont to hold off the prow with their poles, bring the boat to a sharp angle with the strand, and then swing her stern round till she came parallel with the current. But on this occasion they failed; the current was too swift for them; we were travelling at the rate of nearly three miles an hour. Bang against the bank went the boat, butting at it with all her might. Apart, however, from one or two somersaults, and a few shovelsful of earth dropping on board, no harm was done.

After we passed the forest-dune of Balik-ölldi (the Dead Fish) the velocity of the stream was still further increased. Three years ago the river, leaving the Kona-daria (the old bed), together with its forest-belts, on the left, carved for itself a new channel of close upon two days' journey in length.

Upon entering its new channel the river completely altered its character. It became narrow and straight, and had every appearance of not having yet completed its work of erosion. The country through which it ploughed its way was utterly barren, the soil being sand; the only relief to the prevailing desolation was an occasional poplar and a few tamarisk groves. The margins of the new channel were defined with the greatest distinctness, making a straight, deep, narrow trough, completely filled from side to side with water. All along the sand was continually tumbling down the precipitous slopes, so that a cloud of smoke, as it were, hung over each bank. We were several times in danger of being swamped by these sand avalanches, and once at least the men on the after-deck got a thorough good splashing as a huge mass toppled into the water close beside them. And as the current was swifter than ever it had been before, the greatest vigilance and care were called for on our part to prevent a catastrophe. In fact, we felt rather helpless.

All at once we heard a desperate shout from Kasim, "Stop! stop!" The river was not more than a chain wide, and in the



Our Camp at Ala Kunglei Buzrugvar.

very middle of the fair-way a poplar stem was stuck fast in the bottom, and around it a large quantity of driftwood, reeds, and other flotsam had accumulated, making a small island. In fact, driftwood and so forth was generally more abundant in these new-made arms than in the older parts of the river, owing to the fact that every scrap of brushwood which was carried into the water along with the crumbling banks was swept down by the current; though this was not always the case elsewhere. The flood chafed against the impediment in its path till it was white with foam and tossing spray. Had the ferry-boat come into contact with that snag, it would infallibly have been swung round, wedged fast, and capsized. We were only 50 or 60 yards from the dangerous point, and an upset seemed unavoidable. I sat with my heart in my mouth, wondering if the expedition was to be shipwrecked in this boiling cauldron. The men shouted backwards and forwards, and there was a fearful uproar on board. But at the last moment Alim managed to jump ashore with a line, although, owing to the steepness of the bank, he as near as nothing fell back headlong into the river. But he recovered himself, and scrambling on to firmer ground began to haul away with all his might, while the other men helped him all they were able by pushing vigorously against the stream, shouting frantically, "Ya Allah! Ya Allah!" The lumbering craft came to a stop a few feet above the poplar, and as she hung amidstream the river boiled and heaved along her sides.

While the men were getting the big craft into form to pass this dangerous obstacle, I stepped into the skiff, and anchoring it in the middle of the river, proceeded to take the velocity. But the suction of the current was so strong, it was not easy to keep my balance. Indeed I came within an ace of going overboard; while the boat half filled with water, and my map-sheet got saturated. For the moment the anchor bit in the bottom, the skiff heeled over so much that she came broadside on to the current, but as soon as the rope which was attached to the anchor was pulled round to the bow, she straightened herself into line with the stream, and there hung, swinging to and fro like a pendulum, while a seething eddy gurgled away on each side of her bow. The velocity was over $3\frac{3}{4}$ miles an hour; and this rate was maintained all the next day.

After this no further incident occurred whilst we were travelling through this desolate region, which, to judge from

the character of its banks, was a close neighbour of the great desert of sand which lay to the south. Hunters going in that direction were said occasionally to come across the tracks of wild camels not far from this Yanghi-daria (new river); but those shy denizens of the desert never showed themselves at the river itself.

Upon reaching the masar of Ala Kunglei Buzrugvar, where some shepherds were dwelling, we deemed it advisable to stop for the night, especially as the men wanted to go up to the shrine to thank the saint for having brought them safely through the perils of the day. It was, however, anything but easy to stop our leviathan in full career. I put to shore in the skiff; then Alim flung me a line, at which I hauled away until I got the big boat so close in to the bank that he was able to jump out and take the line from me. And even when our clumsy craft was moored fast to the bank, her old timbers creaked and groaned, and the water splashed and gurgled against the skiff which lay fastened under her stern. The avalanches thundered down the banks, the sand whistling as it trickled after them, and the fire on shore crackled and hissed; but except for these things the entire neighbourhood was wrapped in peace, especially as the dogs were still, there being literally nothing for them to bark at.

The banks here rose 15 feet above the actual level of the stream, while the high-water line was five feet higher still. During the night the river rose half an inch; its transparency extended down to only $2\frac{1}{8}$ inches.

The next day the Tarim was not quite so straight, but the velocity still remained the same. The chief danger we had to guard against was the back-current in the sharp elbows. In one of these the skiff was on the point of being crushed between the two bigger boats, but I managed to save her just in the nick of time. Very early that morning we had our first glimpse of ice, on a small sheltered pool on the bank.

Before the day was over we came, on the left, to the reunion of the Yanghi-daria and the Kona-daria, and after that the stream reverted to its normal character. A short distance below the confluence the river embraced a small reed-grown islet, which, with its perpendicular edges, looked like a river-fortress. We encamped for the night at Tellpel, where dwelt nine shepherds, with their families, in charge of 8,000 sheep.

The shepherds in this part of the country used a different

Fishing Apparatus on the Tarim, as used at Tellpel.

sort of fishing apparatus from that which I have described above. It consisted of a net stretched fanwise on a light, triangular framework of rods, and was fastened so as to hang outspread just above the surface of the water, while by means of a line going back to land, it could be raised or lowered at will. When the net was let down and spread out the fish were frightened into it, and it was then closed by means of the side-rods, then whirled round like a paper-poke for sweets, and hauled up to land.

The yoll-beghi had now left us; but at Tellpel we picked up a fine old fellow named Mollah Faisullah, who was 54 years of age, had a big white beard, wore horn spectacles, of Brobdingnagian dimensions, and was always cheerful and talkative, and read aloud to the men on the after-deck. He was invaluable.

On the 4th and 5th November the river once more altered its character, becoming narrow and violent, with a sharply defined channel. On both sides it was bordered by a vast steppe of yellow reeds, amid which a few solitary sand-dunes bearing tamarisks stood out like islands. It was, in fact, something intermediate between an old and a new-formed bed; indeed, I was told it was some eight years old. The name of the old course, which the stream abandoned eight years before, was Kök-chöll-dariasi. All this showed that the Tarim does change its course, though in these longitudes for short distances only. At the same time it was interesting to notice that whenever it did so, it always left the old channel to the north, or, in other words, shifted to the right.

One thing which contributed to relieve the monotony on board was the doings of our dogs. Sometimes they would jump overboard, swim to land, and accompany the flotilla the whole day long on the bank. But they never succeeded in learning the laws which determined the river's course. When the ferry-boat drifted along the inner side of an elbow or curve they kept close beside it; but when it was carried by the current right across to the inner side of the next elbow near the opposite bank, they always took to the water, and swam across, so as to remain in our immediate vicinity. This manœuvre they repeated time after time; it was impossible to make them understand that if only they waited we were bound to come back to them again. Some days they crossed the river a score of times, and became so done up that they howled from sheer

weariness. Yolldash was killing as he splashed about, gasping for breath, and spluttering to get the water out of his throat.

At Initshkeh the river had a volume of 2,847 cubic feet in the second, and it was easy to see it was slowly rising; in one night, indeed, it rose two inches. This measurement took me a good three hours to accomplish, and had to be made by the light of a lantern. The river was too wide to allow of a rope being stretched from bank to bank in the usual way, to which to fasten the skiff. In fact, the current was too violent —3¼ miles an hour—we could not get the rope across at all. I tried to row across, but had to give it up. Instead of a rope we flung across a thin piece of sail-twine, divided by white knots, and at every knot anchored the skiff and took our measurement.

During the night of the 4th and 5th November the river rose another inch; and the banks were here 16¾ feet high. The Tarim turned again towards the north-east. On a sandy tongue of alluvium at Hässemet-tokai a dozen big vultures, clumsy birds of a dark-brownish grey, almost black, in fact, sat and watched our approach, merely turning their heads like sun-flowers as we slowly circled round the projecting headland on which they were assembled. What brought them there was the carcase of a horse, which lay half out of the water in an angle of the river. Most of the flesh was already devoured, and the foul birds appeared to be sated; for they had flown a little way off, and were digesting what they had gorged upon, in company with two or three unabashed ravens. A little lower down we passed a couple of score more vultures, sitting immovably on the leafless branches of some dead poplars. There they perched, in the stunted forest, like spirits of the infernal regions or the harpies of death, their weird aspect being quite in keeping with the Stygian scrub and air of desolation which marked their surroundings. It was a much pleasanter sight to watch the wild-geese sailing through the air in their irreproachable phalanxes, a single bird in the van and the others trailing out behind it like an arrow-head, except that one of the barbs was generally longer than the other.

Another characteristic of this part of the Tarim was the large quantity of driftwood which floated on its surface, and of poplar-stems which stuck up snag-like from the mud at its bottom. Several of the latter would eventually sink; others were just on the point of breaking off and floating away. As

only one end was fast in the mud, the other lay along the surface, where it wriggled and nodded like a water-snake swimming towards us. But what deceived us was the eddy, caused by the current striking against the impediment. It was not the poplar, but we who were moving, and as we drifted over it we could hear it snapping like a water-ogre down below.

On the 6th November we picked up a fresh guide at the sheep-fold of Bostan. All the same, we still kept old Mollah Faisullah on board, for he was cheerful and amusing, and read to the other men stories about the deeds and sufferings of imams and heroes, and about fabulous cities, each with a thousand gates, and a thousand watchmen beside each gate. The people of Bostan wanted to give us some melons; but we declined them, melons were too tender to stand the frosty nights.

This day the river made only one bend, but that was a double one, like the letter S, with an island in the one loop and deposits of mud in the other. At Dung-kotan the banks presented a very curious formation, owing to the river having washed away or cut in half the poplar-studded sand-dunes which there touched it. They looked like so many gigantic prompters' boxes. The tree-roots stretched obliquely down the steep banks and were rooted in the bottom of the river, so that they resembled taut violin strings or nets set to catch fish

We camped that night at Kara-dashi, not very far from the place where, in 1896, we first found water after our dangerous journey across the desert north of the Keriya-daria.

Next day we observed several reed-huts, and even houses of clay, and occasionally a canoe moored to the bank, clear indications that we were once more drawing near to inhabited regions. The canoes now began to resemble somewhat those which I remembered in the Lop country, being long and narrow, hewn out of a single poplar; but in contrast to the Lop canoes their fore-part was prolonged into a sort of perforated handle, and the stern formed a little platform on which a man could sit. The paddle, by which they were propelled, was shovel-shaped.

My boatmen appropriated a tiny specimen of these craft, in which Alim gave us quite an exhibition. No matter how he paddled the thing, it would not go straight forward, and, in spite of his frantic efforts to balance and control it, gave him many a lurch now to one side, now to the other. When we reached

Chong-aral, the men exchanged it for a larger one. For it was by no means our intention to steal the canoe, and so levy a contribution upon the peaceful inhabitants of the river-side; we desired to pay for it, and did pay for it later on in the afternoon. After that Islam and the Mollah travelled in the canoe, which thus added another vessel to our flotilla.

The country hereabouts was extraordinarily open. The woods receded so far apart as to appear mere black lines on the horizon. It was only very occasionally that a solitary poplar broke the dead level of the interminable reed-beds which fringed the banks.

A branch of the Shah-yar-daria (Mus-art), which came from Khan-tengri, entered the Yarkand-daria from the left in the district of Gädyiz. It was 95 feet wide at the actual confluence, and apparently preserved the same breadth as high up as we were able to see. Its bed was filled with stagnant water, beautifully clear and of a blue colour, and transparent to a depth of $30\frac{3}{4}$ inches, whereas the Tarim was transparent to a depth of $1\frac{1}{2}$ inches only. The dividing-line between the two was very sharply drawn, the muddy water merely flushing and clouding the clear. The fact is, the arm of the Shah-yar-daria, with its standing water, formed virtually a continuation of the containing bank of the Tarim, which accordingly merely brushed against it in passing.

Whilst I was engaged examining this affluent from the skiff, an old man arrived, wearing a violet chapan, and attended by several other persons, and offered me his services; he was the yoll-beghi, or road-commissioner of Chimen. And he brought with him letters from Niaz Hadji and the Cossacks, reporting all well with the caravan.

When we reached the village of Terez, we found a great quantity of gifts in kind awaiting our arrival, such as sheep, fruits, two boxes of pears from Kuchar, a box of pomegranates, besides hares, pheasants, hens, eggs, and milk—a very welcome replenishment of our commissariat. Our vehicle of travel had this advantage over camels, that, no matter how heavily we loaded it, it never murmured, and went just as well, and just as far in the day, equally whether heavily or lightly laden.

That night we encamped at the point where the river was crossed by the high road from Kara-dash and Kungarchak-bel to Chimen, Shah-yar, and Kuchar, the very place, in fact, where I forded the river on the ice in 1896. Khalil Bai, the same

honest old man who gave me the hospitality of his house on that occasion, now came to meet me, in spite of his seventy-three years, supporting himself on a long staff. I was always pleased to see the old friends of my previous journey; accordingly I sat and talked with the old man beside the fire for a long time.

At Chimen we rested two days, which I partly employed in determining the position of the place astronomically, in measuring the volume of the river (2,454¾ cubic feet), and in getting through various arrears of work. Here also we were found by Abdurrahman, the first of the jighits or couriers from Kashgar, who brought me nothing but the best of news in his

Canoes on the Middle Tarim.

sealed post-bag. I sent him back to Kashgar with my own letters, and at the same time gave him a hermetically soldered tin-box containing negatives. Further, I engaged a fresh hunter as guide, and bought a supply of oil in case it became necessary to continue our journey at night by lamplight.

The 10th November was the first real winter's day we had. The morning was bitterly cold, a moist fog clung to the earth, and only disappeared after a determined wind got up in the south-west. The ground was white with rime-frost, as also were the ferry-boat and its black cabin. The air was grey and misty, the sky obscured with clouds, the entire landscape clothed in the cold blue-white tones of winter. Fortunately, I had

left the last negatives I developed the night before lying in the bath-trays, which were only just frozen on the surface. Had I set them up in the frames to dry they would have been frozen, and so ruined. It was not until after 11 o'clock that the thermometer rose above freezing-point, so that I judged it wise to warm the dark room a little, to prevent the negatives from freezing whilst they were drying. At 10 o'clock in the morning the thermometer stood at −2°.0 C., or 28°.4 Fahr., and at five o'clock at −1°.0 C., or 30°.2 Fahr.; it was above the freezing-point not more than five hours altogether. The outlook for a successful termination of my project began to look dark; for if the river began to freeze now, we were hardly likely to reach the end of the journey before we got fast in the ice. Meanwhile we were all longing to get away from Chimen, which not only stood in an open and exposed situation, swept by every wind and every storm, but was in a bare country, where firewood was a scarce commodity. Abdurrahman the courier was taken across the river in a canoe, with his horse swimming beside him; poor beast, I pitied it on such a cold morning! But I confess I was quite relieved when I saw the man safe on the other side, with my precious packets in his hands.

The beg of Shah-yar, who had come with a mounted retinue to pay his respects to me, gave me a present of a new dog, a most comical little pup called Dovlet, who looked like a fox and was a veritable four-legged clown. From the very first he proved himself an excellent watch-dog, and was at once established as the prime favourite of all the two-legged passengers on board, except the cock.

My old friend Khalil Bai, in return for a present I had given him, was anxious to show his sense of politeness by accompanying us on horseback to our next encampment. But we induced him to take his place in the circle which sat around the blazing fire on the after-deck; but even there he shivered with cold, and longed for the great camp-fire of the evening.

Lifting anchor, then, we glided softly away from the shore and the people gathered on it, and were soon carried by the strong wind out of sight of their wondering eyes. The flotilla numbered four vessels. As we generally had two guides with us now, I directed one of them to lead the way in the canoe. He was followed by Kasim in the heavily-laden commissariat boat. Favoured by the south-west wind, we made a long day's journey. The open river-bed wound away towards the east,

The Beg of Shah-yar and his Attendants Waiting to Receive us at Chimen. The Ferry-boat on the Left.

and except for the patches of forest which it occasionally brushed against on either side, it ran through a region of unbroken kamish steppe, intermingled with extensive high-water alluvial deposits.

On the 11th November we passed several shepherds' camps, the sheep belonging to the bais of Shah-yar; and on the 12th the woods along the banks began to be more plentiful and more beautiful. Every morning now every sheltered nook and side channel was frozen over, and sometimes we saw thin cakes of ice, which had been formed close to the bank, swimming down the stream.

Our Pilot-canoes from Chimen.

In this part of its course the river was called Ughen or Öghen, also Terem or Tarim. The canoes which now dotted its banks were made on precisely the same pattern as those of the Lop country. Every day thousands of wild-geese passed westwards over our heads. In all probability these were the last of the pilgrims, warned to make a hasty departure by the rapid approach of the wintry cold. There was now scarcely a leaf left on the poplars; they had put off their autumn attire, and stood bare and naked, awaiting winter's approach. The fallen leaves lay on the banks in heaps and rustled quite crisply under the wayfarer's footsteps.

On the following day, in a sharp north-going loop, we passed

the confluence of the Inchikkeh-daria, coming in from the left. In the tent it turned so bitterly cold that, in order to obtain some advantage from the sun's warmth, I transferred myself to the skiff. The temperature of the water at midday was only $3\frac{1}{2}^{\circ}$ above freezing-point; and the long punting-poles were cased with ice. Every angle which the midday sun was unable to penetrate into was fringed with a margin of ice a foot broad and half an inch thick. As a rule it hung out a little above the surface of the water, the river having dropped since it was formed. The main mass of the forest stood however somewhat back from the margin of the river, and only sent a few outposts close up to it. That evening we had to hunt for some time in the darkness before we hit upon a suitable camping-ground. Islam and Naser were put ashore, and went off on foot, and it was getting quite late before we saw their signal-fire blazing up in the distance. They had pitched upon a place where an old *sattma* (shepherd's hut) stood, and, banishing all respect for the crazy affair and its owner, had used up the materials of which it was built to feed their fire with.

Our days now passed quietly, peacefully, and monotonously. The advent of winter made scarce any difference in our manner of life. The chief thing was, that we now wanted a larger supply of firewood; but our caterer in this respect was not at all stingy, if only we took care to choose a proper place for camping in. Young forest was no use; it must be dry wood. I was not wakened now until half-past six, and it was no joke to tumble out and struggle into your icy clothes in about 20° of frost. Under these circumstances dressing was performed with the utmost dispatch, the niceties of the toilet being accurately proportioned to the number of degrees registered by the thermometer. But this proceeding over, and the first series of meteorological observations taken by seven o'clock, it was quite a pleasure to hurry up to the fire, which crackled right cheerfully in the grey of the morning. As I stepped on shore I was received from every side with friendly and polite greetings of "Salaam aleikum!" At that hour the men were generally busy over their breakfast, which consisted of boiled mutton, with bouillon, into which bread was crumbled, and tea. As I sat by the fire, I usually had my breakfast too. After that I measured the banks, and when all was ready, and the men were thoroughly awake, I cried "Mangeleh!" (Let us go!), and in a minute the mooring-ropes were loosened, the poles were in

the water, and off went the big boat again on her long and lonely journey down the Tarim.

Fortunately, the river was now so deep that we very seldom ran aground, and when we did so we were mostly able to get off again by using the punting-poles. The after-deck of the big ferry-boat presented quite a picturesque scene—boatmen, sheep, poultry, sacks, and packing-cases, all mixed together in any sort of order, while the column of smoke from their fire trailing down the river behind us invested our imposing craft with the fictitious dignity of a steamboat. It was on the after-deck the men baked their bread, there they dried my wet clothes on an outstretched rope, there they washed their dishes, and there they made such implements and household utensils as they needed. Naser was employed in shaping with his axe a specially long-bladed punting-pole, with which to prize out the ferry-boat when she got into a back-current. Kasim and Kader had somehow somewhere got possession of a couple of canoes, with which they manœuvred the commissariat boat, when their punting-poles failed to reach the bottom. When the time hung heavy on their hands, one of them would start a song, in which all joined, and very tuneful their voices sounded amid the great silence of the woods. But towards evening their songs would die away; they began to long for the rousing, roaring camp-fire. But we usually continued a good while after sunset, steering our course by the light of the moon. There was neither fire nor light on these deserted banks, except the feeble gleam which the fire on our own after-deck shed upon the reeds at their margins, while on the river the moon's rays broke on the curling eddies which dimpled its surface.

When at length I called "Indi toktamiss!" (Now we will stop), everybody on board at once woke up. The ferry-boat was made fast. A few brands were carried on shore to light the camp fire, followed by such cooking-pots as were required. Then the *ash*, or rice-pudding, was mixed with pieces of meat and vegetables in a huge pan. After that another of the men took ashore the box containing my dinner ware. The tea, seasonings, and jams were set out near the fire. As all the ingredients for the ash had been already prepared on board, it was not long before Islam came to announce that "Ash tayyar!" (Dinner is ready). Nor did the men tarry long before they donned their sheepskins, and arranged themselves in a circle round the fire. So long as the flames were strong and high,

their only concern was to protect their backs; but when they grew sleepy, they pulled the sheepskins closer round them, crept in nearer to the dying fire, which they left to take its chance through the night, and were always industriously snoring away a good long time before I had finished jotting down my notes and writing up my diary, and was able to follow their example.

CHAPTER XI.

WITH THE YUMALAK-DARIA THROUGH THE DESERT.

On the 14th November we travelled at a mean rate of $1\frac{3}{4}$ miles an hour. During the night it froze, and when we awoke in the morning all the boats of our flotilla were frozen in, though the ice was thin. The only one which could possibly suffer from this was the little skiff, whose canvas hull ran a risk of being cut by the sharp edges of the ice. The alluvial deposits along the shore were as hard as stone, and when struck by the ice-coated punting-poles, gave back a hard, grating, almost ringing noise. During the day, however, we observed only one piece of floating ice, about 5 or 6 square feet in area; indeed, it was quite a chance we saw it at all in the muddy water. So far the frost had never penetrated deeper than three-quarters of an inch; but even that was sufficient to give rise to very peculiar mouldings, flakes and bell-shaped mounds along the line of the water's edge, caused by the soft mud underneath having been washed away, whilst the frozen layers were held fast by the frost. But as soon as the sun began to beat down upon them with any degree of power, they of course thawed, and then toppled headlong into the river. We did not see any more wild-geese; even the very last of the stragglers seemed to have gone now.

A little way ahead we perceived four men standing on the bank as motionless as statues, watching us; but when we drew nearer, off they went in headlong flight, and left all their belongings behind them. These included four fierce dogs, which pursued us for some time, barking frantically. After that we saw the shepherds' horses, and they, too, accompanied us a little way.

As soon as it grew dark I bade our only guide, Rehim Bai, go on first in the canoe, and pilot the way, or rather illumine

the way, for he carried, fastened to a sloping pole, an enormous Chinese lantern, with a strong oil lamp inside it. I instructed him to keep about two hundred yards in advance, and from him I took my compass-bearings quite as well as I took them by daylight. The reflection from the lantern, playing upon the rippling surface, made Rehim's canoe look like a Venetian gondola.

The volume of the river at our next camping-ground, Teppeh-teshdi, was 2,691 cubic feet in the second, that is to say, 236 cubic feet more than at the last measurement.

Immediately after starting on the following morning, we passed the boundary-line between the two *tabesi* or administrative districts of Shah-yar and Kuchar, the boundary being marked by a conical stack of poles, to the east of which the shepherds of Kuchar alone had the right to graze their sheep.

A great number of ducks were wintering in the Tarim, and Islam was often fortunate enough to surprise them.

In the neighbourhood of Källälik, where we stopped for a short noontide rest, we discovered an unusually well-built hut of clay, surrounded by several sheep-folds. The only creatures we saw, however, were a dog, some poultry, and some lambs; but we readily understood that the inhabitants had fled as soon as they caught sight of our ferry-boat. A fire was burning in the hut, and over the fire hung a kettle, while clothes and other objects lay scattered over the floor. We explored the thickets in the vicinity, but found nobody. At length, however, a solitary boy showed himself in the distance, but we had regularly to hunt him down before we could catch him. The poor fellow was, however, so terrified that we could not get him to open his mouth, let alone give us any information. He simply stood all a-tremble, without daring to lift up his eyes.

I wonder what strange stories are now current in the forests of the Tarim with regard to our remarkable colossus and its prolonged voyage! How many and many a time did we not find empty huts, which their owners had only just deserted! What must these simple shepherds have thought when they saw such an odd-looking monster approaching them silently, like a crouching tiger? Did they imagine it was some monstrous amphibian, with terrible antennæ, which it moved backwards and forwards? Many took to their heels straight-away, as though the Author of all Evil were after them. Others

probably stood at a safe distance, on the edge of the forest, to see what was going to become of this unspeakable thing. And I dare say yet others are running still, as terrified out of their wits as if they had seen a hobgoblin of the forest. Who that knows the genius of the Asiatic mind for exaggeration and superstition can doubt that a plentiful crop of legends and tales has already grown up around the track of our uncouth leviathan, and that these in process of time will crystallize into a marvellous relation of the triumphal progress of some river deity, desert king, or forest magician along the great watery highway of his dominions?

At Khadeh-dung, where a sand-hill, 26 feet high, overhung the river, I dismissed, on the 16th November, the guides whom we had brought with us from Chimen; their knowledge of the local topography was exhausted. Hence, as we found nobody to take their place when we started again, we had no guide except the sinuous windings of the river itself. Our chief concern now was to get hold of a man who could go with us and give us local information. At length we saw a shepherd boy tenting his sheep, and we managed to get quite close to him without being observed; but when he did perceive us, off he went at full speed. But have him we must; so once more we organised a regular chase, which, though it cost us a good deal of valuable time, ended in the capture of our quarry. The boy told us that the name of the district was Sarik-buya, and that before evening we should find an inhabited place on the left bank. This information turned out to be correct, and we obtained there a capable pilot.

The sun was no longer strong enough to thaw the sheets of ice which formed on the lagoons beside the river; but the ice continued to increase in thickness until it would bear the dogs, which, when swimming to dry land, had often experienced great difficulty in scrambling through the thin ice which fringed the bank. These marginal braidings of ice were now visibly increasing in size; and it was evident it was their intention to stretch a bridge right across the river from bank to bank, and incorruptibly block our way. The small patches of drift ice, which now became quite common floating on the surface, came from the entrances to these lagoons, and from the river-ice immediately adjacent to the banks, not out of the lagoons themselves.

It had now become the established rule for our day's

journey to be extended to twelve full hours, the moon being assisted every evening by the rays of the Chinese lantern. This evening we saw in the distance a solitary fire on the bank. It turned out to be at Dung-kotan, a place which I visited in 1896, and consequently made a fixed-point for my map. Kader, the bai who dwelt there, gave me a good deal of very valuable information about the changing characteristics of the river at different seasons. He also told us that tigers were very common in that locality. I bought from him the skin of a big fellow which had been shot there about a fortnight before. The year before that, too, tigers had been shot at Dung-kotan.

It is an astonishing thing that these simple forest-men, with their primitive muzzle-loading muskets, should really tackle and destroy such a beast as the tiger. Of course, they have to resort to craft, or else they would never do it. Suppose a tiger has carried off a horse, or a cow, or a sheep, and gone into the reeds with it. There, having satisfied the first cravings of hunger, he leaves what he does not eat, and when he goes away from it, always follows a well-trodden shepherd's track. It is this peculiarity which has procured him his Turki name of *yollbars* (the panther of the path). His footprints reveal where he has gone into the reeds and whence he may be expected to emerge; while the remains of his feast betray that it is his purpose to return to the same spot when he gets hungry again. Then it is that the natives place a spring-trap (*kappgan* or *tosak*) in the path, concealing it well with branches, brushwood, and leaves, while underneath it they dig a hole about two feet deep. If luck is against the tiger, he steps into the trap and is held fast. Now, the trap is made of iron, and is so heavy that the tiger is only able to drag it after him when he moves backwards. Consequently, it is impossible for him to run off with it, especially as the jaws have a terrible grip and are set with sharp teeth. Although the animal's spoor is very distinct and easy to follow, his enemies generally let at least a week pass before they venture to approach him. Meanwhile, the tiger, being deprived of the power to move where he desires, is unable to procure food, and consequently gets famished with hunger, and begins to pine away. At length, however, the shepherds approach him on horseback, and generally shoot him from the saddle, so as to be safe against attack if the tiger, making a last

desperate effort, should try to throw himself upon them. The animal whose skin I had just bought was already done for when his enemies approached within about forty-five yards of him, and lodged the fatal shot in his left eye. Yet so great was the respect his destroyers had for him that, although the first ball made him roll over on his side, they nevertheless gave him five more before they ventured to draw close up to him and dismount. Their triumphant satisfaction at slaying the worst enemy of their flocks may well be conceived.

The tosak is a cunningly-devised instrument, like the English rabbit-trap or rat-trap, a semi-circular scissors or shear-like arrangement, the two sides of which are made to clap together by means of two steel springs of enormous power. The inner edge of each side is set with sharp teeth, which, when the trap is closed, interlock with perfect exactitude. The springs are so powerful that it requires a strong man, exerting his full strength, to force the toothed edges back into the position they are to remain in when the trap is set. The ring is then pushed close up to the two claws, and kept in place by a simple combination of a cord and two pins. It is the tiger's weight as he steps upon the cord which causes the trap to spring and hold him fast by the paw. On one occasion a tiger was caught by the toes only; but he tore himself away from them and, though maimed, escaped.

Lower down the river, towards the Lop country, tigers are quite common, especially on the left bank. They seldom show themselves during the day, but at night haunt the shepherds' tracks.

The slayer of the tiger accompanied us on the 17th November. The river, which pursued a general east-north-east course, was narrow and winding, and was accompanied by a labyrinth of ancient beds containing stagnant water, side-channels which only filled when the river was in full flood, and marginal lagoons surrounded by reeds and forest. On the left lay a very extensive lagoon, and on the right was the Hassanak-daria, a peculiar *cul-de-sac*, into which the river only penetrated at high flood, and there stood without going any farther. Speaking broadly, my map of the Tarim is only an instantaneous photograph, for every year some fresh branch or other is carved out, old loops are abandoned, new marginal lagoons are formed, while others dry up. It is, in short,

a restless and unstable stream, and as the country is flat, it incessantly changes its course in a very capricious manner.

After the sun had set, the moon rose—a ruddy-yellow globe climbing up a light blue sky; but as she brightened and grew whiter, the sky took on a deeper shade of colour. Viewed against this background, the contours of the inclosing river-banks stood out as sharp-edged as silhouettes clipped out of black paper. The wan, wintry tones which nature had assumed made everything look hard and frigid. The Tarim glistened like a sheet of cold blue steel, and the only places where it showed signs of movement were just round the snags,

The Yumalak-daria (Tarim), seen from Koral-dung.

which stuck fast in the bottom. The moon hung so low down in the sky that its orb seemed to roll across from the one bank to the other, according as the river wound to the right or to the left.

We met the first Lop-men at Lämpa-akin on the 18th November. They were a party of three, an old man and his two sons, proceeding up the river in three canoes, with their nets and other accoutrements for fishing. They were taken so utterly aback when we suddenly came upon them in the middle of a loop that they never dreamt of trying to escape, although it would have been easy enough for them to do so, in their light, swift nutshells. After a good many objections, the old man consented to go with us, while his two sons pursued

their journey; and, as it turned out, he was intimately acquainted with the district.

At Koral-dung (the Watch-Hill), on the right bank, through which ran the boundary between Kuchar and the Lop country, we rested for a long time. The river there had a volume of 2,571 cubic feet in the second. Immediately south of the hill lay, glittering in the sunshine, the greenish-blue lake of Koral-dungning-köll; its water was as clear as crystal, half-frozen over, and surrounded by tamarisk thickets and kamish fields of extraordinary density, through which ran numerous tiger tracks, showing that these black-striped beasts were in the

Koral-dungning-köll.

habit of haunting the place at night. During the summer these reed marshes were flooded; indeed, the ground was still moist at the time of our visit, although there was no water except in the shallow marginal lagoons. From that point the lower Tarim was called the Yumalak-daria, or the Round River; it stretched at first towards the north-east, but soon afterwards turned to the south-east—a narrow ribbon winding through a vast wilderness of reeds.

On the other side of Atchal the river underwent another metamorphosis; it shrunk to a breadth of only 66 feet, was as much as 23 feet deep, and without a single trace of alluvial formation. The high terraces which confined it were frozen as hard as stone; if by any chance our craft came into contact

with them, it was like touching a quay of marble. On the right of the river at this part lay the lake of Ak-kumning-yugan-köll ("the Big Lake in the White Sand"), embosomed among sterile sand-dunes, and so great that the voice of a man shouting on one side of it could not be heard across on the other side.

On the 19th November we again passed a long string of marginal lagoons. Indeed, this tendency to shed off side lagoons was characteristic of the Lower Tarim, and became more pronounced in proportion as Lop-nor was approached. Tograk (poplar) forests now became very common again. Except for these, the river-bed was bordered by tall strong yellow reeds, which leaned picturesquely out over the river like hanging hedges. As our heavy colossus brushed against them, their brittle stalks crackled, snapped, and broke.

That evening the sunset gave rise to remarkable colour effects, the entire expanse of the reeds being lit up with an intense ruddy yellow glow, as if somebody had set them on fire. Dark and silent, the inky-black water of the Yumalak-daria wound through the thickets where the royal tiger had his lair. The ice-sheets which covered the lagoons whistled and whined. Occasionally a flash as of lightning would gleam across the dark river in front of us, as some sheet of floating-ice, hitherto invisible, was caught edgewise in an eddy and tilted up a glassy corner, upon which the rays of the sinking sun caught, broke, and dispersed as if scattered by a prism. The dead poplars, swart and naked, stretched their gnarled and rotten arms out over the river as though even in death blessing its life-giving waters.

Again the river began to serpentine and wind to such an extent that I frequently found it necessary to take two or three hundred compass-bearings in the course of a single day. We had secured yet another Lop-man to act as guide, and in one of the marginal lagoons we went past, he caught us a few fish. The lagoon in which he caught them was long and narrow, and lozenge-shaped; it lay behind a tongue of alluvium, and was covered with ice strong enough to bear a man. It is in such pools, where the water is still and clear, that the fish are wont to be found at that season of the year. Having placed his net across the mouth of the lagoon, the man drew back a little in his canoe; then, standing in its stern, he drove it with all his might, with a broad-bladed paddle,

against the edge of the ice, immediately above the outspread net. The ice, being brittle, broke under the weight of the canoe and the force of the impact. Then the Lop-man smashed it right through to the far end of the pool, and pushed the ice adrift upon the river; after which he drove the fish into the net with his paddle, and then went and picked up the net and drew it into his canoe. When, however, the ice proves too thick to be broken in this way, the Lop-men frighten the fish into the net by beating its surface with their paddles. In the larger marginal lagoons fishing is carried on all winter, even after connection with the river is cut off.

The concluding portion of our day's journey on the 20th November led due east-north-east. With my telescope I discovered, a long way ahead, half-a-score men waiting for us on the bank. They were the begs of Tograk-mähälläh and Kara-chumak, two villages situated in the vicinity. They told me they had been ordered by Fu Tai, governor-general of Urumchi, to go and meet a *chong mähman*, or "distinguished guest," who was coming down the Yarkand-daria. The Chinese had thus got their eyes upon us, although from a distance, and rumours of our journey had travelled far and wide. But for all that, they neither knew where we started from nor yet where we were going to; all they knew was that we were extraordinarily strange beings. More than two years after this, when I was in Ladak, I was asked by some Indian merchants whether I knew anything about a white man who had spent several months sailing in a boat down a big river a long way off to the north. Such a thing would be impossible, they declared, on the Indus.

Yunuz Beg, the most distinguished man amongst our new friends, had been expecting us for several days, and had ridden some distance up the river to meet us, but failing to find any trace of either boat or sail, had returned to the place where we encountered him. Now, however, he was eager to bring forward his stores of sheep and melons and fresh fish.

Ketchik, the place where we encamped, was a very interesting spot. The name signifies "ford," and was acquired because the road from Kakteh to Karaul crossed the river there. These crossing-places generally occur in the perfectly straight reaches, where there are no deep trenches, pits, or excavations in the bottom. On the left our river was joined by a large dry bed full of mud. This I learned was formerly

used by the Tarim, which had come down that way for a period of at least fifty years, for the old man who was my informant remembered it from his childhood; but four years before our visit, the river had completely deserted its old course, to which it did not now bequeath one single drop of water, even when at its highest. The new branch, which did not reunite with the old river until several days' journey lower down, ran towards the south-east, through an entirely desolate tract of country, in which before its advent there had existed nothing except a series of shallow lagoons. Here again we had an illustration of the changeableness which characterises the hydrographical relations of those regions, and which became more pronounced the nearer we approached to the Lop country and the more insignificant the fall of the Tarim became.

The region we travelled through during the next few days was therefore a *terra incognita* to most of the natives. The velocity of the new stream, the first day we spent on its bosom, was approximately $3\frac{3}{4}$ miles an hour. The begs and all their gifts having been stowed on board, away we went, preceded by two Lop canoes, one of them navigated by four men. The latter went splendidly; being but a narrow trough, all four men paddled standing, and only the last one of the four was visible, although the four paddles struck the water separately without any regard to simultaneity. The reed-beds were still tolerably dense, though tangled, and no longer grew in one continuous mass, but were broken into belts and disconnected patches. The river was undecided about which direction to pursue. It described no big or definite loops, although it was full of small sinuosities, as though seeking and trying to find the way which would suit it best. Time after time the current was divided by small islands lying athwart its course. Here we might easily have gone astray, had the canoe-men not darted on ahead and tested the depth of the passages with their paddles. Even with their help we were kept in a state of perpetual suspense by the contracted water-gaps, poplar snags, accumulations of reeds and floating jetsam of all kinds, as well as by sharp turns and foaming rapids. Besides, every now and again, we encountered a living poplar, standing on its own roots in the middle of the river—a clear proof of the recent formation of the channel. These spreading trees were so dangerous and so threatening, that we sometimes deemed

Stopping for Breakfast on the Yumalak-daria.

it advisable to lower the tent and take down the meteorological observatory just before we came to them. On the right the river was bordered by a chain of lakes, the last of which, Buya-köll, communicated directly with the main stream through a channel beset with a great number of tiny islets—in fact, a Swedish *skärgård* in miniature.

On the other side of that place we struck the Chong-ak-kum (Great White Desert), as the great desert was there called. At the same time the sand-dunes closed rapidly in upon both banks, and in proportion as they did so the belts of vegetation which accompanied the river grew thinner and thinner. The transition was very sharp. We left the last of the poplars behind us, while on our right the reed-belt swung back so as to admit the absolutely barren sand-dunes right up to the river, where they came to an abrupt termination at the water's edge or at the margin of the flat alluvial deposits in the river-bed.

As soon as it grew dusk, I transferred myself to the skiff and followed immediately behind the Lop-men's canoes; but it was so cold, I ordered one of the men to bring me a fire-basket and place it on a piece of planking in the bottom of the little boat. Owing to the alarming pace at which we went, the boatmen were kept incessantly on the *qui vive*. But as soon as we entered the sandy desert, with the high dunes on both sides of us, it darkened rapidly, and so we halted. The Lop-men had with great foresight filled their canoes with drift-wood, which they fished out of the river, so that we soon had a couple of big fires roaring away. In this region the river was called Tärim, Yanghi-daria, or Chong-daria, in addition to the names I have already mentioned.

On the 22nd November the Yumalak-daria flowed towards the south-east. Its new channel was carved through the outer margin of the sandy desert, and any dunes which chanced to stand in its path had been swept aside by the irresistible energy of its hungry flood. Against this great power of nature, animated as it was by the inflexible law of gravitation, the sand was absolutely powerless.

On both sides we were now shut in by sand-dunes rising to a height of 50 feet; those on the right bank, where the sand was the more developed, were often entirely sterile. And yet it was not a hopelessly barren region; for every now and again we came across a solitary poplar, while tamarisks, true

children of the desert, were relatively numerous, and a narrow ribbon of reeds still clung to each bank. It is a surprising circumstance that the sand-dunes should possess sufficient consistency at their base thus to present perpendicular faces to the water; the reason is, their lower strata were wet. Higher up the sand was loose, as it generally is, and there the sides of the dunes were seamed with tiny channels, down which the sand trickled until it came to the edge of the precipice. This it descended in a series of little falls and cascades, and these sand rivulets continue to flow as long as they are fed from above. But when the time-glass is exhausted, the dune becomes "dead," eaten away, as it has been, by wind and current. Yet even then the orbit of the sand is not completed; for it is caught up again and driven further on in its restless wanderings by another force. The "desert ocean" has its pilgrims also, and its inorganic life is as much subject to laws of periodic movement as the organic life which pulses under the shade of the palm-trees in more genial climes.

On these fabulously desolate shores there was an utter absence of organic life—not a human being, not a four-footed animal, not even a raven or a vulture, the privileged visitors of the desert. The only indication of any creature ever having been there was a *saldam* in a poplar-tree, a species of look-out made of branches and twigs plaited together, in which some hunter hid himself whilst lying in wait for antelopes that might chance to come down to the river to drink at sunrise. Again we were engulfed in that awful Asiatic silence, a silence as of the dead. No greeting came to meet us from the heart of the desert. The river, the river alone, sang its rippling song to the unresponsive sand, a song which would very shortly congeal on the lips that sang it.

And every hour which passed that same singing Tarim carried us deeper in amongst the dunes, into a land that was utterly unknown, for even our Lop-men had never been there before. If ever we stood in need of pilots to point out the way, this surely was the time, and they were our men. Dipping in their paddles, in a moment or two they were out of sight behind yonder projecting elbow. But anon they came back, to warn us of some critical passage or other they had discovered. They were the light, swift cruisers which scouted around our heavy battleship, and darting on in front showed us the fairway. Strange! Very strange to be crossing one

of the earth's greatest deserts—by water! Not so very long ago I had nearly died there for want of it!

On one occasion our canoe-men came and reported that the river divided into five arms, and guided us to that which they considered to be the principal one. The pass ran between two islets of flotsam—reeds, branches, and rubbish—and was so narrow that the water was lashed into foam on both sides. Guiding our clumsy craft as straight as we could, we glided into the watery alley. Both her sides were scraped; nevertheless we struggled through and came out into open water; but then we ran aground. The river was equally shallow every-

A Canoe Making a Reconnaissance.

where from bank to bank; yet advance we must, let the cost be what it might. And we *did* get over, thanks to the slight rise which had taken place in the current during the past twenty-four hours. Had the current fallen to the same extent, it would have been far worse. How often did we, I wonder, just scrape over sand-banks and shallows without suspecting it! I dare say that many a time it was such a near thing it would have been impossible to put a sword-blade between. So far the river had been gracious to us; might it still continue so!

In a poplar-grove, where we landed, and where I took some photographs, we observed large numbers of tiger-tracks; but

though I went on that occasion, as well as on others, a little way inland, and looked about me from the top of a hill, I never had the good fortune to see that fierce, yet fascinating, beast in his native haunts.

This Yanghi-daria, or New River, furnished yet another illustration of the great river's tendency to deviate to the right. If any deviation took place on the left bank, the water invariably found its way back into the main stream; but not so on the right. There the new branch strove to get away from its parent, and sought to carve a new path for itself still further in the same direction. Once, long ago, the Tarim used to empty its waters into the ancient lake of Lop-nor; now it pours them into a new lake, far to the south, having thereby taken a gigantic step towards the right.

During the last few days we had not seen very much ice; the current was too swift to permit of its formation. Still by eight o'clock at night the thermometer was down to −6°.0 C. or 21°.2 Fahr. Day by day the race between ourselves and the frost—the moment when the river should become totally frozen over—grew more and more interesting. There could not be many days left to us now, for each succeeding night it grew colder. Yet I dreaded the hour when we should be compelled to say good-bye to our floating home, and abandon her to her fate. Clumsy though she was, ungainly though she was, I had learnt to have an affection for her—something akin to the feeling one cherishes for the farm where one has lived long and prospered. She had made us a comfortable home; she had carried us safely through the whole of East Turkestan. She had spared us the daily recurring worries of pitching tents, of packing and unpacking, of unloading and loading up, and the care of a troop of caravan animals. Besides that, I had a dark-room always ready, my instruments were always working and in good order, I had everything I needed conveniently within reach, and when I wanted a glass of cool fresh water, I had only to stretch out my hand to get it.

On the 29th November we had a volume of 2,497 cubic feet all day long. That was of course sufficient; but the ice! When would it stop us for good and all?

CHAPTER XII.

FIGHTING THE DRIFT-ICE.

FOR the first part of our journey on the 24th November the Tarim was once more inclosed between belts of forest; for it swept round two long curves, shaping itself like the letter W, the points of which touched the desert on both sides, though the stretches between were lined with woods. At intervals we met Lop fishermen, and saw long rows of fish hung up to dry outside their temporary quarters. At intervals, too, we observed a dried fish-skin hanging on a pole; this was to indicate that fishing was forbidden there, owing to somebody having claimed the fishing rights. The fish-skin was the owner's notice board.

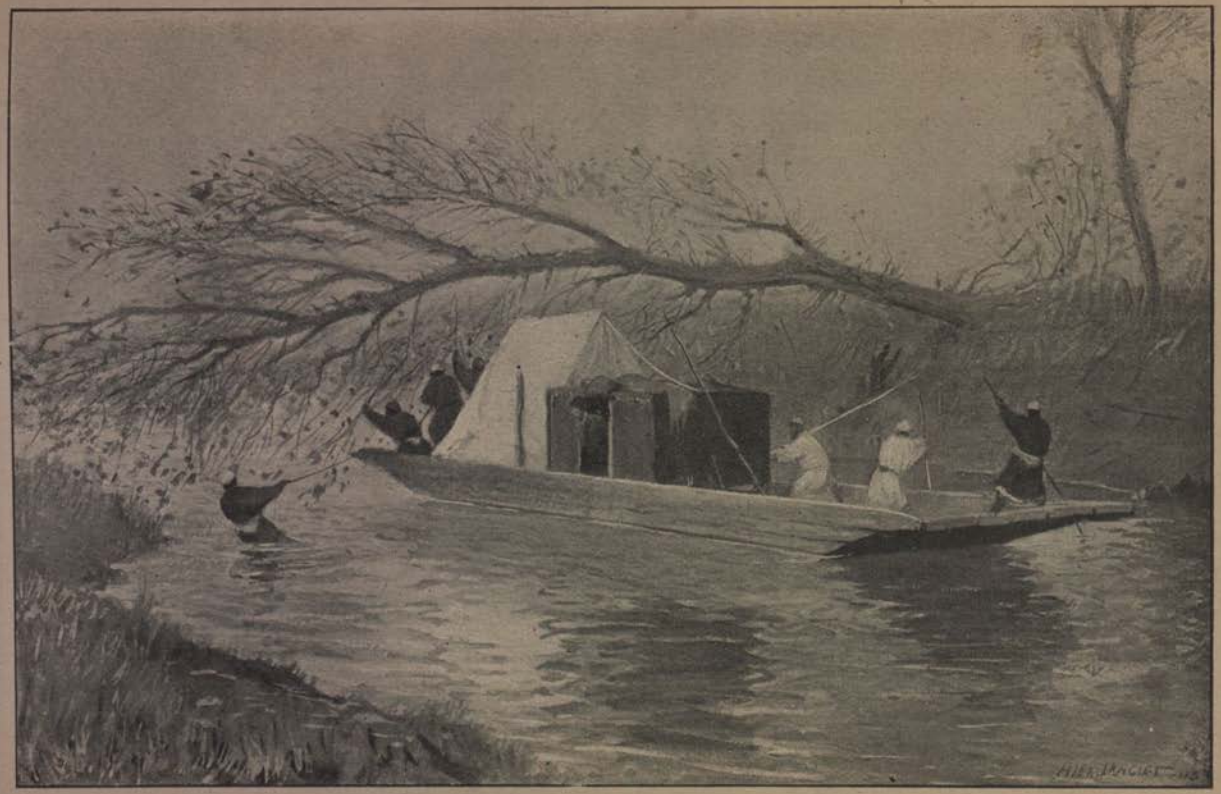
This day we came within an ace of suffering shipwreck. The current swept with undiminished force and violence, close in against the bank in an exceptionally sharp angle, and there a gigantic poplar, undermined by the stream, had fallen prone across the river, hanging just over the current at about one yard above the surface. The remaining portion of the river's breadth was occupied by a broad eddy, which swung round very slowly, and set up a back current. It was an easy matter for a Lop canoe to pass under the overhanging poplar, but had the ferry-boat come into collision with it, everything would infallibly have been swept overboard—tent, boxes, packing-cases, black cabin, everything—or if we had drifted sideways against it, and our top-hamper had offered sufficient resistance, we should in all probability have been capsized. It would have been a trial of strength between the upper framework and the tree, and the latter was so massive it looked as if nothing could move it.

As it happened, the big ferry-boat was just then leading the flotilla, and was slipping unconcernedly down-stream with-

out the least suspicion of anything being amiss. But just as we were on the point of entering the quickened current immediately under the bank, there came a desperate cry of warning from Palta. The poplar was only about a score of yards in front of us. The river was deep; the punting-poles were not long enough to reach the bottom. In, then, with the new-made sweeps, two men to each, for they were heavy and long. The men shouted. The river broke into a kind of cataract, it was moving so swiftly. One moment more and we should be shipwrecked. Down we drifted, straight upon the poplar. Could nothing be done? Was there no means of averting a catastrophe? The men worked like demons. I seized hold of my map-sheets and note-books, determined to save them if I possibly could, for if once they had gone down in that muddy water, it would have been good-bye to them for ever. Islam and the beg ran to the fore part of the boat, ready to grasp hold of the poplar and as far as they could break the force of the collision. But just at the last moment the boatmen succeeded in swinging our leviathan off into the eddy, where she slowly spun round and finally glided off on the back current. Yet even then we were not safe. The stream would have brought us back to the ill-omened poplar again had not Alim jumped into the water—it was only (!) 1°.4 C. or 34°.5 Fahr.—and though it reached up to his arm-holes, hurried to the left bank with a rope. Fortunately the bank was low, and he had no difficulty in landing. After that he towed us safely past the danger.

Whilst we were being slowly turned by the eddy, Kasim and Kader went spinning past us with the commissariat boat and the skiff, both driving straight down upon the poplar. But they saved themselves by a clever manœuvre. Warned of what lay ahead of them, they unfastened the skiff, and giving her a vigorous push as they flew past, managed to send her close up to the big ferry-boat, where we caught hold of her, and held her fast. Meanwhile they steered their own craft close in under the right bank, so that Kader was able to jump ashore with a line. Nevertheless, their craft got in amongst the branches of the poplar, and Kasim had to hang on to it to prevent himself from being swept overboard. It was only by the skin of their teeth that they escaped coming to grief.

Now if this adventure had happened at night, it would not have been the ice that would have brought my river journey to an abrupt termination. But good luck was once more a passenger



Our Way Stopped by a Fallen Poplar.

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with us, and we were allowed to drift on further down our watery highway. But my Lailik boatmen began to be filled with amazement, not to say consternation. They thought the river never would come to an end, but went winding, winding on for ever towards the east. When they thought of the enormous distance they had travelled since they left their homes, their brains turned dizzy; they were utterly unable to form any numerical idea of what it amounted to. All they knew was that between themselves and their homes at Lailik there stretched an interminable maze of storms and mists, of sand-deserts and impenetrable woods.

Canoes on the Lower Tarim.

By the time we had recovered from our fright, the sun was beginning to set, and I turned on the musical box to cheer the men up a bit. Islam had just come to bring me a dish of fresh-cooked fish, which had a most delicious smell, and I was comforting myself with the thought of getting something nice and hot to warm me, when we heard frantic cries for help from up-stream, where Kasim and Kader were following in our wake. The shouts were so piercing and so full of anxiety that we were all alarmed. I at once gave the order sharply to pull in to land; but we were right in the middle of the stream, and it took some little time to pilot our stupid monster to the bank. I was afraid one of the men was on the point of being drowned, or was actually already drowned.

The moment we touched land, all the men rushed away back up-stream, plunging through the thickets, scrambling through the reeds. I shouted to them to send me word instantly what had happened. After a while one of the Lop-men came back, and said that the commissariat boat had been capsized by an unseen snag. As soon as I was satisfied that both the men were safe, I felt easy, and fell to on my fish, which however had, in the meantime, grown cold.

The end of the adventure was of a tragi-comical character. Down the river came, merrily dancing on the water, the various effects which had been spilled from the commissariat boat, and hard after them the Lop-men in their canoes, fishing up whatever was worth saving—buckets, tubs, boxes filled with flour, baskets full of fruit, flat disks of bread like the leaves of a new kind of water-lily, punting-poles, and a multitude of odds and ends scattered widely over the river from bank to bank. A certain number of things had been rescued at the spot where the misfortune happened, amongst others our two sheep, which swam ashore ; but several others, such as an axe, a spade, a lantern, and so forth, were irrecoverably lost.

We encamped where we were, Islam and Alim making up two huge fires. It was very late when the other men came in with their boats and such of their wet cargoes as they had been able to collect. Kasim was greatly cast down, but he was really no way to blame for the accident. Whilst he and Kader were endeavouring to avoid a snag that stuck up from the bottom of the river, they got caught in an eddy, and from that were flung into a strong current, which carried them straight down upon another snag that they did not see, and consequently could not guard against. The skiff received the first impact, a long rent being torn in her side, though fortunately above the water-line. When the commissariat boat went over, Kader, who was unable to swim, scrambled into the skiff ; but Kasim clung to the poplar stem which caused their shipwreck, and there sat and shouted for help until a canoe fetched him off.

On the 25th November we were joined by the *shang-yas*, or begs, of Chong-tograk and Arelish, each bringing a canoe with him, so that our flotilla now numbered ten vessels, and we made quite a stately procession as we slowly moved along the face of the Tarim. The two begs stationed themselves beside Palta in the prow, and took a turn at the oars, that is to say, the new sweeps or flat-bladed punting-poles ; so that we

Gigantic Sand-dunes on the Right Bank of the Tarim near Tokkuz-kum.

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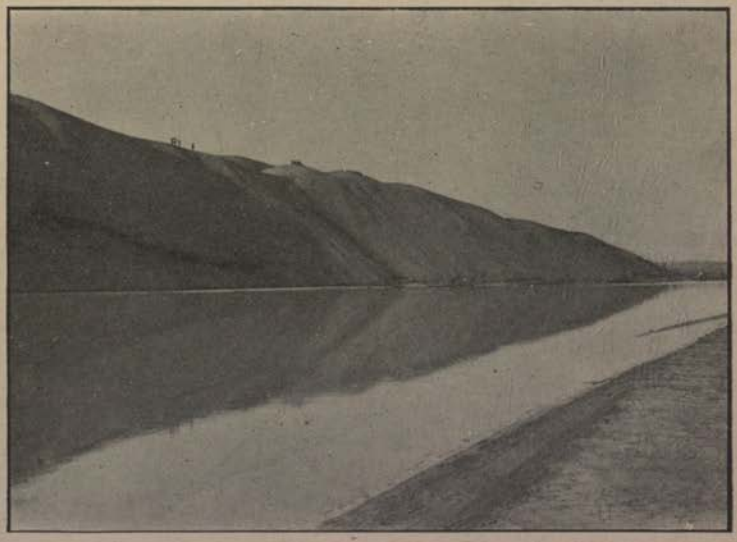
now moved a little faster than the stream. Whilst Islam was sewing a patch over the rent in the one half of my little skiff, one of the natives manœuvred the other half, to the intense amusement of his compatriots. We encamped at Tokkuz-kum (the Nine Dunes). My Mohammedan friends were of opinion that, provided the weather kept calm, we might continue for another three weeks; but if a *buran* (black tempest) were to come on, the river might be stopped in the course of a single night. The lower part of its course froze first, and after that the upper part; in other words, the frost travelled up-stream against the current. They told me, as the result of observation, that the colder the water the faster it flowed. This might be true theoretically; but it was hardly likely to be perceptible to the naked eye.

On the following day we were carried directly towards the highest part of the Tokkuz-kum dunes—gigantic, and in the highest degree imposing, accumulations of yellow drift-sand. They too, like the other dunes I have mentioned, were stragglers from the great desert; but they advanced so close to the river that their bases were washed, and even undermined, by the water. These dunes were the biggest accumulation of sand I have ever seen, and I could not resist the temptation of stopping and climbing to the highest point to take a look round such an interesting country.

Leaving the ferry-boat moored to the left bank, we paddled over in the canoes, and started to climb the steep slopes. But it was hard work; the sand was so loose, we sank deep into it at every step, and often slipped backwards. Eventually however we reached the top, and found ourselves on the summit of a steep wall that went straight down into the river. The scene which met our eyes was one of singular majesty. I was amazed at the astonishing forms into which the active powers of nature had sculptured and modelled the relief features of the earth's surface. I knew what it was to travel over an oceanic expanse of sand, crumpled into ridges, hundreds of feet high. Many and many a time my eyes had rested upon the all-dominating "waves" of sand, sand, sand, and once more sand, which follow one another for endless miles across that stupendous "desert ocean," and it was a precisely similar landscape which now lay unrolled at my feet. But here I stood at the northern fringe of the great desert ocean, and its edge was as sharp cut as the sea-coast or the shores of a lake. The outermost verge

of the desert consisted of a wall or terrace, a bent bow of absolutely unadulterated sand, which plunged straight down into the river at an angle of 32°. The sand in the vicinity of the river possessed a greater degree of consistency or firmness than the sand in the interior of the desert. This was owing to the more abundant degree of humidity which visited it, partly in the shape of dew, partly in the form of actual moisture which it sucked up mechanically. And it was in consequence of its greater firmness that the sand assumed the peculiar contours—depressions, terraces, and cones—shown in the accompanying photograph (compare also illustration facing p. 202). Seen



Tokkuz-kum.

from the left bank of the river opposite, this great wall of sand looked perfectly vertical, and suggested that, if a man were to attempt to come down the face of it, he would start a fresh avalanche, and be infallibly swept to destruction. These dunes were about 200 feet high, and persons standing on the top of them appeared to be exceedingly small.

The view down the river was in its way equally impressive. Deep down below our feet the stream wound like a canal, and disappeared in the east in a labyrinth of eccentric sinuosities. A tiny lagoon was ensconced between two of the dunes, but was sadly cramped for room. The margin of the desert was just as sharply marked on the eastern side of this colossal

aggregation of sand as it was on the western. The poplar woods began again quite abruptly without any transition, the trees standing in thick clumps on the very skirts of the dunes.

A short distance lower down we came to Al-kattik-chekkeh, where dwelt Istam Beg and ten families in huts built of reeds and laths, and placed all together in a clump for the sake of protection against cold, and wind, and the heat of summer. The entire population of the place, some forty souls in all, men, women and children, in all their picturesque rags and dirt, were immortalised on the accompanying photograph (p. 207). Amongst them was an old man of ninety, who sixty years before had come thither from Kara-köll. He was blind, and sat crouched over the fire, and wept because he had lost his sons, and had nobody to look after him and care for him. He also spoke of the capricious changes in the course of the great river; but his memory was defective, and I could place but little reliance on the information he gave me.

After we had measured the river, which had 2,663 cubic feet in the second, Istam Beg invited us to go and fish in a creek on the inner side of a silt bank. The pool was covered with ice 1½ inches thick, and the method of procedure was that already described, except that on this occasion two nets were used. The first was dropped across the mouth of the creek. After that the ice was broken for a distance of ten or eleven yards, and at the edge of the ice, as it was then left, the second net was dropped. Then the two nets were drawn together. This manœuvre was repeated two or three times, until the end of the creek was reached, and the last haul of course gathered in all the fish that remained. The water was only three or four feet deep, and the nets were kept vertical by means of stones fastened to the bottom and bunches of dry rushes tied at the top. These latter served also as "floats," for they bobbed up and down when a fish got fast in the meshes immediately underneath. Then that part of the net was swiftly lifted with a paddle, and the fish killed by a blow on the head. The total catch amounted to twenty-six fish.

Our days were now reckoned. There was no blinking the fact any longer, for although the temperature of the water kept a little above freezing-point during the day, it always sank below it during the night, and in the morning our flotilla was frozen in and had to be hewn out. The Lop-men had warned us, that after the first drift-ice appeared, it would only be ten

days more before the river ceased to flow, and this moment we were now anxiously expecting every day. It came on the 28th November. When I stepped out of my tent in the morning, I found the entire surface of the river spangled with patches of soft, porous ice, consisting of crystals and needles which had been formed on the bottom, or at any rate below the surface of the water, and which on coming to the top became agglomerated together into flat cakes or disks, often as white as snow on the top. These formations, an unfailing harbinger of the speedy freezing of the river, were called *kömul*, or *kadeh*. As soon as they appear, the fish desert the river, and take refuge in the creeks and marginal lagoons; whereupon the Lop-men become high busy gathering in their stock of fish for the winter months.

It was a cold, dull morning, and the sky was cloudy. We chopped out our boats with axes and iron-bars; but a fringe of ice which remained clinging to them along the water-line never thawed all day long. Everything was frozen; ropes and lines were as hard as wood, and the velocity-instrument was sheathed with ice, and had to be thawed at the fire before we could use it. The natives had protected their canoes by drawing them up on land. Although we had a fire fore as well as aft, we all shook with cold; the men, however, kept up their spirits by singing all day. I suspect the Lailik boatmen would not be overpoweringly sorry if we did get frozen fast: it would mean that the journey was then over for them, and they were free to return home.

From now onwards for the rest of the journey we had to steer our course amongst these drifting sheets of ice. They formed a fresh source of interest for the men, who never grew tired of watching their erratic progress down the capricious river. Being always most numerous in the centre of the stream, they were constantly being drawn into the eddies. They jostled one against another, until some of them were pushed back into the current. They ran aground on the sandbanks, which jutted above the water's level. They went dancing down the stream like little islands afloat. They collided with one another. They ground their edges together. They ran atilt against our boats. They were smashed to pieces; they were fused together. They stuck fast in the bank, and spun round and round. In short, they played the most fantastic tricks imaginable, until they disappeared—which the greater part of them did by one

The Village of Al-kattik-chekkeh.

o'clock, and by four o'clock every one of them was gone. But we had had our warning: in a few days the river would be impassable.

That day the Tarim's course was unusually changeable. It began in a very promising fashion by stretching out towards the north-east. But when it reached Köttektu-körruk, a little fishing lagoon wedged in between two sand-dunes, it unexpectedly wheeled quite round to the west; then, encountering firm sand on the left bank, it flung itself back through a series of erratic windings to the north-north-east.

Drift-ice on the Lower Tarim.

We encountered several fishing-parties. One canoe was so heavily laden, its gunwhale was just level with the water.

We stopped to take our measurements at Siva on the left bank, where there were some fine poplar woods. This was in all probability the last time I should be able to perform this duty in the old way, for my little skiff, which the men called *kagaz-kemi*, or "the paper boat," would not stand much contact with the drift-ice. The volume was 2,559 cubic feet in the second. From observation of the high-water marks and other indications, I should judge that, when in full flood, the river here carried something like 6,110 cubic feet in the second, or even more.

On the 29th November winter took another big stride onwards. The thermometer dropped during the night to

– 16°.0 C. or 3°.2 Fahr., and the temperature of the water was just at the freezing-point. The river wore a strange and unfamiliar aspect; its surface being so thickly strewn with white drift-ice, that it would have been easy to imagine it had frozen and then been covered by a thick fall of snow. It was not, however, quite so bad as that yet. The white-sprinkled surface kept up an incessant movement, like a gyrating side-walk; and each succeeding day the *kömull*, or *kadeh*, became more abundant. To stand on the bank and fix our gaze steadfastly upon the glittering white belt as it hastened on and on made our eyes swim, until we fancied it was the river that was motionless and we ourselves that were drifting up stream.

The night before this we made a very unfortunate choice of a camp—namely, in a small sheltered creek. When we awoke in the morning, we were frozen in so fast that we could without risk walk all round the boats, and it took a pretty good while to cut a canal through the ice to let us back into the river. The outer edge of the ice-sheet was washed by the current, which piled up upon it a rampart of drift-ice as white as snow. The patches of floating ice were bigger and more compact than we had hitherto seen them, and when they crashed together it was as if somebody were smashing porcelain. All day long we were accompanied by sounds which resembled the playing of chimes in a distant church, and the millions of ice crystals sparkled like diamonds in the sunshine. The incessant "sissing" and whizzing of the melting ice-needles, and the painfully bright light which they gave off in the process, had a stupefying, almost a hypnotic, effect upon the senses.

Upon examining it closer, I found that the kadeh consisted solely and entirely of tiny laminæ and spicules of ice, all exceedingly thin, but fused together in large numbers. So long as they remained under the water, they possessed the same colour that it did; but when they emerged above the surface, they at once became as white as snow. The disks of drift-ice, which were composed of this loosely-aggregated, supersaturated material, were seldom more than a yard in diameter, and generally round, owing to their never-ending friction with one another and with the banks. Owing to the same cause each disk was edged with a raised flange, about four inches high, which also gleamed white by reason of the upper face of the disk being a smooth, bluish-grey surface, at the same level as the surface of the river.

Journey by Night amongst the Drift-ice of the Tarim.

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Thus we were surrounded by a countless number of snow-white rings, the burial-wreaths, as it were, of the great river. For months we had been living its life, now we were to be partakers in its burial.

The sun of course failed not to exercise considerable influence upon these floating disks ; but at noon the river was still covered with them, and, though they thinned out somewhat, they did not all disappear entirely.

All day long we had the lofty and sterile sand-dunes on our right ; but between us and them there was always a belt of yellow kamish intermingled with poplars, brownish-grey, leafless and melancholy. The ground was everywhere frozen hard, so that the men were no longer afraid of venturing into marshy or recently inundated places. The river here exhibited the same characteristics as the Yarkand-daria below Lailik. We had again the same big broad alluvial islands and headlands, and the river-bed was wide and fenced in by high escarpments, crowned by ancient woods.

A lofty piece of sterile sand, near the right bank, was called Ansash-kum, after an old *pavan*, or hunter, long since dead, who used to climb it to see if he could detect any antelopes or wild camels in the vicinity. The latter, which used occasionally to come through from the desert, never show themselves near the river now ; although Kamber Shang-ya of Kara-chumak declared that he had shot seven farther south, beside the dry course of the Opgan-daria. But the shepherds of the Tarim forests know nothing of the wild camel visiting them, and when asked about it invariably answered, they had heard there existed such a creature, but a long, long way off in the desert.

We went on for about an hour in the dark, guided by the rays of our Chinese lantern, but it was ticklish work shouting and halloing at every sandbank and shallow. We only ran aground once, however, but then such a quantity of drift-ice accumulated behind the ferry-boat, it was more difficult than usual to get her off. When we pulled up for the night, we took precious good care not to enter any of your sheltered creeks ; we did not want to be caught in an icy rat-trap. On the contrary we anchored in the very middle of the current ; but the little skiff we drew up on land, safe out of harm's way. The big ferry-boat was moored with her stern towards the bank and her fore-part sticking out into the river, for I thought I should like to have my Venetian balcony hanging over the

running water. But as I sat at my table and entered my observations for the day, every disk of ice that drifted past knocked against the old craft, making her creak and shiver from head to foot at each blow.

By this the ice had begun to form in earnest along both banks, and every day the fringe grew broader and broader. For the present, however, the frost confined its attention to the quiet waters close in under the banks, where there was no current, and to the accumulations of driftwood and flotsam which were held fast nearer the middle of the stream.

All night the drift-ice went on bumping, scraping and jarring against the ferry-boat; but it did not in any way disturb my sleep, and in the morning it was not quite so plentiful as on the previous day, for the thermometer only fell two or three degrees below freezing-point. In fact the river was barely half covered with ice; yet strange to say, although the sky was clouded, so that the sun's rays were unable to get through, the greater part of the ice eventually disappeared. By evening the few *kadeh* which remained were extremely soft, as well as few and far between. The river's course was unusually straight. We made a long day's journey (the 30th November), and all day we had on our right the high sand, resembling a mountain-chain with its weathered, denuded, and rounded forms, putting me in mind of the ranges of northern Tibet. We did not see a single human being, nor even a column of smoke. The only signs of the existence of man were certain skeleton platforms made of posts, which were said to be used by some pavan or other as a safe place in which to leave the antelopes he shot, out of the reach of wild beasts. Of birds we saw one pheasant, one hawk, a couple of ravens; these were the only living creatures.

I generally worked 14 hours a day, beginning at 6.30 a.m. when the fire-basket was brought into the tent. I did not take my breakfast of boiled fish until after we were well started. I also ate my dinner on board; the dinner-service was there quite ready to hand, and it was not always so convenient to land in the dark. Time was now so precious, that I did not lose one single minute. My barber, Islam Bai, even cut my hair as I sat at my work-table.

The next day, the 1st December, the Tarim still preserved the same character, flowing in wide curves towards the north-east, accompanied by plenteous forests, and backed by the yellow

sand of the desert, which, however, was increasing perceptibly in volume. The river maintained the same level, neither rising nor falling. The transparency went down to 2¾ inches, and the erosion terraces were five feet high. At the only elbow which penetrated the sand we landed, and from the top of the dune took a few views, one of which is here reproduced. There was now a greater difference than formerly between the different parts of the river. The actually flowing current was grey, and thickly beset with white disks of drift-ice; whereas the lagoons at the margins of the river and behind the alluvial deposits were a clear greenish blue, and covered with glassy ice some four

View up the Tarim from the Right Bank (1st December).

inches thick, which crackled and "hummed" when you walked across it. Towards the south-east the eye travelled across a veritable wilderness of sand-dunes, until it became utterly lost in the unaccountable distance; and even to the north-west there was a belt of desert sand, though it could not well be very extensive. If we except a few stray tamarisks, the total breadth of the zone of vegetation between these two pieces of desert did not exceed a mile and a half. As a rule the margin of the actual river-bed was everywhere bordered with reeds.

I was awakened early by a noisy bumping against the bottom of the ferry-boat; it was the kadeh rising to the surface. During the night these ice-disks were not visible; but directly the

sun rose, up they came. If, in the morning, you felt the bottom of the river with a pole, it was hard and slippery like ice; but later on in the day, after the kadeh had loosened its hold, it became soft and spongy like ordinary sand. The noise which the drift-ice made grating against the side of the ferry-boat was pretty much as if sugar were being sawn by machinery. At first it made the dogs perfectly frantic, and they barked furiously at the innocent ice-disks. But they soon grew accustomed to them, and after they became still more numerous, and consequently drifted closer together, they even used them as stepping-stones for getting to land.

It was a splendid day, quite warm, and with the help of the fire-basket the temperature in the tent rose to 5°.0 C. or 41°.0 Fahr. We only got aground once; and it was quite a novel experience to see the ice-disks, which had for hours been floating beside us, and in front of us, now all at once go streaming on past us, whilst we stood still. As a rule the ice gave us warning of the shallows and sandbanks. It was itself often as deep as the draught of the ferry-boat, and consequently used sometimes to ground in its turn, and then we would hear it crunching and crashing as it began to pile itself up above the impediment. The Lop-men asserted that the kadeh increased the velocity. But I doubt that; these repeated collisions were calculated to have the opposite effect. When the river flowed quite straight, we drifted along quietly in the midst of the riotous scrimmage; but when we got caught in an eddy, where the ice-disks were present in greater numbers, it became more difficult than usual to get past them.

On the 2nd December we travelled altogether 14½ miles, moving at the rate of 1½ miles an hour, and that almost in a straight line, for the curves were insignificant. The river rose a little during the night; but the water remained just as muddy, no doubt in consequence of the formation of the ice at the bottom. The great sand-dunes of the desert drew back a little from the banks, and eventually disappeared altogether. The marginal lagoons preserved the same character as heretofore; each was connected with the river by a narrow throat or canal, now, however, closed, so that the fish which had fled into them to escape the kadeh were caught in a veritable trap. These tiny lakelets were almost always named after the man who owned the right of fishing in them.

We were now approaching, on the left, the Ughen-daria,

an arm of the Tarim which I visited on my former journey. The patch of desert on the north had come to an end as well as the greater desert on the south, and as the Ughen-daria was bordered by extensive forests, the tract of country in the angle between the two rivers formed an almost continuous forest.

The least breeze made me feel the cold very much more, for it expelled the warm air from the tent, and then the ink soon froze in my pen. The sky was covered with heavy clouds, which hung close down over the earth like a piece of cloth outspread, but did not discharge one single flake of snow. Towards evening, however, the sun peeped out underneath this gloomy canopy like a ball of glowing fire, producing light effects of gorgeous splendour. The entire volume of the atmosphere appeared to be on fire with some inflammable gas, the reeds were a flood of purple, the poplars stood with outstretched arms as if still intoxicated by the glowing kisses of the departing sun, and the lower fringes of the sky burned in every shade of vivid violet. This glorious spectacle lasted, however, merely a few minutes, and was immediately followed by the twilight, which painted everything without distinction its own iron-grey shades. The giant reeds, which had so recently resembled a guard's regiment drawn up on parade, with their full plumes nodding in a bath of gold, were now as uninteresting and monotonous as any ordinary fence of commonplace palings.

We were dying to reach inhabited districts again, the banks of the river were so terribly lonely. Were there actually no shepherds at all in this God-forsaken region? Our guides' local knowledge was giving out; we wanted fresh men, who knew the country better. Yet not a vestige of life or habitation was to be seen between the poplars, except occasionally the tracks of antelopes, wild boar, foxes, and hares.

When it got too dark to see, I commanded "Halt!" The canoes danced along the water like will-o'-the-wisps, their lanterns swinging to and fro at the ends of the poles, and flinging their unsteady light upon the circling disks of ice with which the river was embossed. The eyes were irresistibly drawn to those swinging censers of light; they so completely dominated the scene. That evening we again chose an unsuitable place for our camp, but this time it was owing to the absence of firewood. With the object of getting light by which to search for this indispensable necessary, as well as to illumine the neighbourhood, the men set fire to the dense thickets of reeds

which clothed the banks. They crackled, they hissed, they roared as the devouring flames rapidly got the mastery over their dry flags and stems. It was a stupendous firework-display; and the sight of the cataract of reddish yellow glare, which it poured forth unceasingly over the murky water, with its thousands of swirling ice-disks circling down it, was one I shall not easily forget. Those ice-disks! I could not help fancying they were water-spectres, the cobold children of old Father "Nick," who were let loose for a nightly frolic or carnival before the long Lent of their winter sleep. They put me in mind of a procession of outlawed Mussulmans, with white turbans wound round their heads—wooers of the wilderness, bedecked with garlands of everlasting flowers of perishable ice.

CHAPTER XIII.

ICE-BOUND.

On the morning of the 3rd December the river was three-parts canopied with ice; but the relative amount of area covered varied of course at different times during the day. When the river contracted, the ice was driven closer together, until not a single inch of water was visible, and our flotilla had the appearance of being frozen fast in a moving ice-field. But no sooner did the channel widen out again than the ice-disks separated, and the water once more gleamed out between them. Oh, those erratic patches of floating ice! How they dashed themselves against the frozen bank, till the air rang again with their metallic laughter! I never grew tired of studying the veined marbled patterns they drew upon the face of the river, nor of observing their glittering shapes—running nooses, arabesques, trailing garlands, slow merry-go-rounds, chaotic forms incessantly metamorphosing themselves into creatures strange and yet stranger—the embodiments of the river's capricious and ever-shifting fancy.

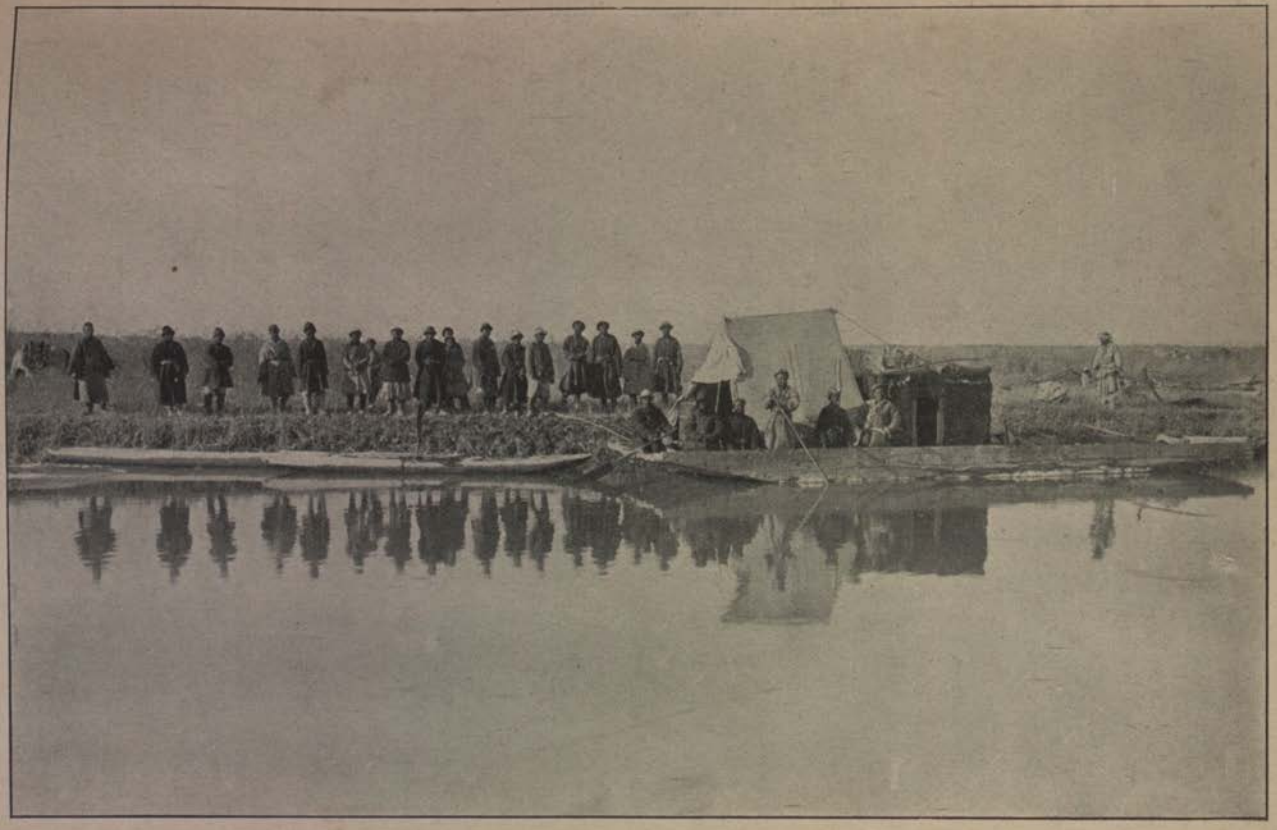
All day the current moved at a satisfactory pace, and we drifted on without let or hindrance past the luxuriant forests and imposing stragglers of the great sandy desert, which continually sprang into view one after the other in a succession of remarkable pictures. But we were no longer journeying on the still and placid waters of the Yarkand-daria. The air was full of murmurs from the grinding ice, murmurs which never ceased, but grew louder and louder in proportion as the river contracted. The icy fringe along each bank was now growing rapidly wider. Three or four days more, and the gap would be completely closed up. Even now those reaches, in which the current slowed down, were in several places coated with a film of ice as bright as glass.

Then the forest thinned out again, the river once more widened, and the country became more open, allowing us to see unrestricted in every direction. Very often the stream stretched straight away in front of us without stop or termination, white as snow, a veritable winter highway. To the right we beheld in the far-off distance, between the scattered poplars, the desolate and menacing front of the desert dunes, and to the left, equally at a great distance away, the thick black line of the forests of the Ughen-daria.

Upon reaching the embouchure of the canal of Dashi-köll, we were surprised by two horsemen, who had been sent in quest of us by Hassan Beg of Teiz-köll. The beg's son was waiting for us, they said, with ten other men at Momuni-ottogo, a good way down the river. The two scouts had arranged that, when they found us, they would notify the fact to their companions by lighting signal-fires. Accordingly we soon saw their smoky pillars ascending skywards ; and when we reached Momuni-ottogo our visitors were waiting for us, with dastarkhan ready and big fires blazing merrily away.

Hassan Beg's son brought us important news. My caravan had halted at Teiz-köll three days before ; the day previous to our arrival it was to be at Yanghi-köll ; and from thence was to proceed onwards to Arghan, the rendezvous fixed upon before we started from Lailik. As we might now expect to be frozen in at any moment, and it would be important to have the camels close by when that occurred, I sent a mounted messenger to Niaz Hadji and the Cossacks, bidding them halt wherever they might be. I learnt further that my old friend Khalmet Aksakal of Korla was with the caravan, and that Parpi Bai, my old servant of 1896, was awaiting me at Karaul.

With regard to the river, I was told, it remained frozen in that region from the beginning of December to the beginning of March, although for another fortnight after that it was covered with melting ice. It did not begin to attain full flood until the beginning of August, and did not reach its highest level before the end of September or beginning of October. After that the stream dropped continually day by day, but for a short period before the ice began to form it remained stationary. Then, shortly after the river became completely frozen across, the water rose again, and lifted up its blanket of ice. This was said to be due to the damming of the river through the packing together of the drift-ice. But as soon as the dam burst,



The Ferry-boat at the Confluence of the Ughen-daria with the Tarim.

the water dropped again. The river was at its lowest ebb in June, when it is possible to ford it on horseback in several places.

It is of course self-evident that the difference between high-water and low-water in the Lower Tarim, owing to its immense distance from its sources in the mountains, must be far less than it is, for example, in the Yarkand-daria at Yarkand or the Aksu-daria at Aksu. The further you descend the river the more does this difference tend to disappear. The volume of the current is also regulated to no slight degree by the innumerable lagoons and marginal lakes which cling like parasites to the Tarim, and suck up its life-blood all the way down its lower course. The spring freshets, which sweep down the Yarkand-daria, the Aksu-daria, the Khotan-daria, and the Kizil-su, with such torrential violence, gradually lose their uncontrollable energy as they travel along. For every one of these countless lagoons, which has dried up during the course of the summer, has to be filled again, and this drains away an immense amount of water. And it is only after they are all full that the river begins to rise in its lower course. Then, when the supply from the upper regions begins to decrease, and finally ceases altogether, these innumerable reservoirs act as regulators of the lower parts of the stream. At the time we left Lailik, it was high-water here in Momuni-ottogo and Karaul; but now in the beginning of December the river had, for some two months or more, been emptying its muddy waters into the terminal lakes of the Tarim system.

Here, then, at Momuni-ottogo we were once more in contact with friendly and helpful natives. The night was dark and biting cold, and the monotonous murmurs of the drift-ice were every now and again drowned by the peculiar sound which attended the formation of the glassy ice on the quiet, tranquil river. The day had been in every way a memorable and happy one. We had made a long and instructive stage, and we had heard good news. But it was also the first Sunday in Advent, and we stood now on the threshold of the Tarim's sepulchre, for the river was being buried more and more under the wreaths of its own white immortelles.

During the last three days the velocity had increased. On the 4th December we travelled at an average rate of $2\frac{1}{4}$ miles an hour; but sometimes even this was uncomfortably fast, for as our ferry-boat scraped and crunched against the edges of the fixed ice she made them hiss and snarl angrily. When an eddy

got hold of her, she drove slap-dash in amongst the ice-disks, scattering them without ceremony. The poplar woods gradually died away, and at Karaul, where we struck the confluence of the Ughen-daria, the country was entirely naked, except for reed-beds, low sand-dunes, and tamarisks.

We stopped at Karaul, for there Parpi Bai and a number of other natives were waiting for us. My faithful old servant hastened on board, and seizing my hands carried them to his forehead; but he was so affected at seeing me again that for a long time he was quite unable to speak. He, too, like Islam Bai, had aged, and got grey hairs in his beard; but in all other respects he was the same fine fellow he always had been. In fact he looked particularly well, owing to the very appropriate dress he wore, a dark blue chapan and a blue cap edged with fur.

We stayed over the whole of the next day at Karaul. I wanted to take an astronomical observation, as well as measure the volumes of the Ughen-daria and the Tarim. The former had no drift-ice at all; but the latter was choke full of it, so that it was more difficult than usual to measure it. The main river carried a volume of 1,967 cubic feet, the Ughen-daria a very much smaller amount. On the other hand, whereas the Ughen was transparent down to 27 inches, the Tarim was transparent to only 3 inches; and the different waters could be clearly distinguished a quarter of a mile below the confluence.

The aksakal of Korla, who also met me here, brought with him two or three boxes of pears and grapes—but the fruit was sadly spoiled by the frost—and a few hundred cigarettes which the Russian Consul at Urumchi had sent me four years before, but which only now reached their destination.

Karaul stands at the point where the river makes the great bend to the south-east which takes it direct to Lop-nor without any further tedious windings. The current was strong; and once, when we struck against a tograk stem that jutted up from the bottom, our boat was helped over by the pressure of the drift-ice. All the same it was anything but a comfortable feeling, for one side was lifted clean out of the water, and after scraping the whole of her length over the obstruction, she banged down again with a loud splash. During the course of the day the sand again approached the right bank. In this, the last section of its course, the river contracted and assumed the form of a narrow canal, hemmed in by deeply-scarped banks, and with only a few small deposits of alluvium.

The Meeting of Parpi Bai and Islam Bai at Karaul.

The 7th of December was our last day on the Tarim. We knew it first thing in the morning, for the caravan was waiting for us at Yanghi-köll, only one day's journey further on, and just below that point the river had frozen over two days before. We started the day therefore with mixed feelings. The Lailik boatmen were glad that the hour of their deliverance had at last struck. Islam and Kader were anxious to get back to their own companions and the life ashore. As for myself, although I was very pleased the journey had been so successful, and had ended at such a convenient place, I nevertheless began the last day of it with feelings of melancholy, for I should be truly sorry to leave the dear old ferry-boat, which for the past two months and a half had made me such a peaceful home.

We were escorted on the bank by three other begs and a large cavalcade of horsemen from the surrounding villages; but I would not allow anybody to come on board, except the beg of Yanghi-köll, a man with whom we were destined to have a good deal to do in the future.

That last day proved to be one of the most interesting of the entire journey; for it brought us into a region wholly unlike any we had passed through before. The river flowed, as I have already said, due south-east. To the east, steppes of grass and kamish stretching to infinity, dotted at wide intervals with solitary poplars; to the west, an unbroken expanse of high and sterile sand-dunes, their bases advancing to the very brink of the river. In spite of this, however, they made room for a chain of peculiar lakes, peculiar in that they were entirely embosomed in sand, and did not support one blade of vegetation on their borders. General Pievtsoff had noted some of them; but neither he nor I were at all aware that their number was so great. I determined therefore to explore them more thoroughly, to map them, and sound them; but I shall return to this again later on.

The river was now in general narrow, and only expanded when it cut into the sand-dunes in getting round a corner. Its bed was choke full of drift-ice, that is to say, two-thirds of it; it was only the centre, the actual current, that was free. In several places we only just managed to get through at the cost of breaking the edges of the fixed ice. which, upon being broken, rang like glass. The ice-disks were getting too crowded, they had not room to swim, but ground against one another, mounted on top of one another, and piled themselves into little ridges on the margins of the fixed ice. Notwithstanding this they con-

tinued to sweep on down the river with irresistible force. The centre of the disks, which only a few days before was so soft, had by this become considerably firmer; a single frost, very little sharper than usual, would cause them to freeze together in one continuous and immovable mass.

The first of the long series of desert lagoons, which hang like grapes on a stalk along the right bank of the Lower Tarim, was called Tuz-algutsh-köll, or the "Lake where Salt is taken." Although I knew I should have a good opportunity later to examine these highly interesting formations, I could not resist landing even now to have a general look at this one. It was squeezed tight in amongst the sand-dunes, and the ice which covered it glittered like a mirror set in a gold frame. The little channel which connected the lake with the river was stopped up with a dam of branches and clay. In this way the lake would be cut off from the Tarim for a space of two or three years, because the natives believe that the fish grow fatter and acquire a better flavour after the water has become faintly saline.

The second lake of the series was the Seit-köll, which penetrated close upon one day's journey into the sand. It was connected with the river by three outlets, all of them stopped, to prevent the flood entering from the river at the next season of high water. One of the three must at some time or other have been traversed by a strong current, for there was a little mill standing on it.

Near the outlets of these lakes were several abandoned villages. At one, Seit-köll, twenty-three families had dwelt; at Tuz-algutsh, nine; and, a little higher up, at Teiz-köll, twenty-five. Their dwellings, huts made of poplar wood and kamish, were still standing, and looked quite new and habitable; yet there was not a living creature about them, nor a single foot-print visible in the sand that was heaped up against them like drifted snow. I was told that these villages, as well as several others lower down the river, had been abandoned seven years before owing to a visitation of small-pox (*chichek*), which literally decimated them. The Chinese authorities had transferred the survivors to the left bank, where they had assigned them parcels of land. Previous to the outbreak these people had lived almost entirely upon fish; but since then they had completely changed their mode of life, and now cultivated the ground, and sowed wheat, and eked out their livelihood by breeding live stock. The soil, however, was only of moderate quality, and although

Ördek in his Canoe, and Palta and two other Men in a Double Canoe, on the Ughen-daria.

they might easily have irrigated their fields by digging rivulets from the river, they did not do so, and the produce was not sufficient to support them, so that they were often forced to sell their sheep to buy themselves flour from Korla. The wealthiest of these people owned as many as a thousand sheep; but the greater part of them were poor, and every summer went back to their old fishing-grounds, the lakes, to fish. Yet they were very careful not to enter their former huts, which awakened such sad memories in the minds of most of them, but lay in the open air. Now, however, the Chinese have introduced

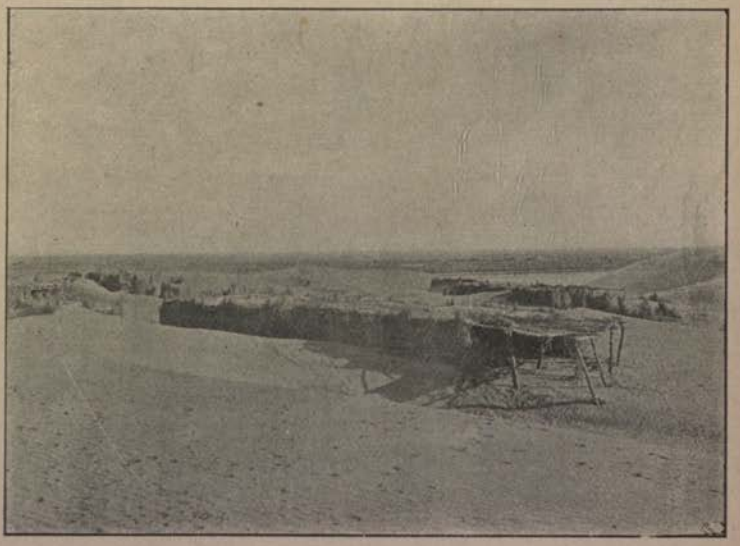
Low Continuous Sand-dunes at Karaul.

compulsory vaccination, although the natives are sceptical as to its efficacy.

We landed again at Seit-köll, and climbed a high dune, which commanded a magnificent view of the lake. This last, which was said to be over 24 feet deep, stretched away about 25° west of south, and resembled a fjord ensconced between vertical cliffs. It was entirely frozen over, though the ice was reported to bear at the outside only.

The elbow at which Seit-köll was situated penetrated deeply into the sand, forming as it were an advanced creek. Originally the great sandy desert extended a long way towards the north-east; but it had been gradually forced back by the river. Thus here again the Tarim was apparently deviating towards the right.

The explanation which the natives of the country offered me as to the origin of these desert lakes was extremely fantastic. They asserted that the canals or outlet channels were dug first, and that, when the river was seeking new passages for itself at the time of high flood, it found its way into them, forced back the sand-dunes, and formed these large lakes. It hardly requires to be pointed out that no amount of digging of canals would have given rise to these lakes had not certain indispensable conditions of nature been already present. From the hydrographical standpoint, the lake of Dashi-köll also was very peculiar. Although it lay quite close to the river bank, it was



Abandoned Huts at Seit-köll.

nevertheless separated from it by a considerable ridge of sand. But quite recently the stream had swept the ridge completely away, leaving lake and river connected and at precisely the same level, so that when the one rises the other rises also, and *vice versâ*. Close beside the breach were some poplars, sticking up without rhyme or reason through the ice. Here again we obtained a fjord-like view, penetrating into the desert.

Nor were these the only lakes of the series; but the others are dealt with lower down.

At a place called Arelish we were met by Chernoff and Faisullah, and yet lower down by Niaz Hadji and several other men of the caravan, all of whom escorted us along the bank, in company with a troop of dogs which they had recently acquired.

The Outermost Sand-dunes at Yanghi-köll.
Parpi Bai, Palta, and Islam Bai.

Their delight at seeing us all safe and sound after our long and trying voyage was indescribable. They had scarcely believed it possible I should be able to navigate our uncouth monster of a boat all those hundreds of miles, whilst they were taking so many wearisome steps along the dusty highways of Turkestan. Having joined hands with our caravan, we were now free to stop wherever we pleased. But when Chernoff told me that only two hours lower down the drift-ice had piled itself up into a barrier, and then frozen into one solid mass, I resolved to push on that far with the help of our lanterns.

The night was however a long way advanced before we came in sight of the big fire which the men of the caravan had made on the left bank, immediately above the barrier of ice. Here then we pulled in for the last time, and went up to the fire to warm our stiff and frozen limbs.

Thus ended our peaceful and fairy-like journey. Those long and happy days, with their ripe harvest of experiences, our adventures and excursions, our monotonous life on board, our Venetian evenings, and the never-ending woods which had strewn our path with their yellowing leaves—all this, as I looked back upon it, seemed like a dream. Never was a journey of that magnitude carried through so comfortably and so successfully. Nothing could well have made a more seasonable transition from the sedentary life I had been leading in Stockholm to the years of toil which now lay before me. I had been carried, as it were, on a triumphal car to the very heart of Asia, and whichever way I turned, there was the unknown beckoning me with its magnetic finger. It was a remarkable coincidence, that we should have been stopped just at the point at which the caravan had arrived. The original rendezvous was Arghan; but the ice prevented us from getting there. This, however, turned out eventually to be no loss, but on the contrary an advantage. For Yanghi-köll was the best possible starting-place for the long and perilous excursions which I had planned to make across the desert both east and west. It was, further, another great advantage not to be too far away from Korla, the nearest town where we could procure what we required for the further equipment of our caravans. It was only a three days' journey thither for a man on horseback.

CHAPTER XIV.

IN WINTER QUARTERS.

THERE was no longer any need for haste, and oh! how delightful it was the next morning, the 8th December, to be able to sleep on in peace, undisturbed! I spent the day copying photographic plates, while the Cossacks went to look at a place that seemed to be exceptionally well suitable for winter quarters, situated on the left bank a few hundred yards above the spot where we had stopped. Thither they removed all the baggage and put up their tents. One of the advantages of the site selected was a tiny harbour, with low, but vertical banks. It was, of course, frozen over, but we broke the ice with axes and iron bars. Our ferry-boat had also frozen fast with a vengeance during the night, and had to be liberated from her icy fetters in the same way. Then she was hauled along to the new harbour, and moored to the bank. This last precaution was a work of supererogation, for it was not long before the boat was embedded in solid ice a foot thick. During the course of the winter the water underneath her became partly frozen also, and our far-travelled dwelling became founded as it were upon a bed of granite.

At first I lived on board, for I had everything handy about me; and I made abundant use of the dark room.

The first evening in our new winter camp gave rise to one of those deplorable and tiresome discoveries which are common when you are so childish or so good-natured as to place too great confidence in the honesty of a Mohammedan. Before leaving Lailik I gave Niaz Hadji 4½ yambas (£36) for the expenses of the journey, partly to provide sustenance for the caravan, partly to make certain other purchases. The amount ought to have been more than sufficient, and there should have been a surplus over; but instead of that my karavan-bashi not only spent it all, but had actually borrowed another four yambas on the

way, which I was now called upon to pay. Accordingly, placing myself on the high seat of justice, to wit a flour sack, beside the fire, I held a searching inquiry, while round about me stood the accused, his accusers, the witnesses, and the spectators. The affair was both solemn and tragic, and I would willingly have paid another two or three yambas to have been spared the painful necessity of sitting in judgment upon my own employé. But it had to be done, both for the sake of the example and warning it would be to the rest of the men, and because it was an occasion on which it was incumbent upon me to exert my authority as leader of the expedition. Calling Niaz Hadji forward into the firelight, I bade him give an account of how he had dealt with the talent I entrusted to him. What sort of an answer he made will be readily imagined by those who have had anything to do with Mohammedans. He tried to show that not a tengeh had been diverted from its legitimate purpose, and that he had honourably and faithfully discharged his office; but he lied. For Sirkin had, at my request, kept an account of the disbursements, so that it was easy to control the caravan-leader's statements. Besides this, the man was also accused of unseemly behaviour towards the other men, whom he looked down upon and treated with contempt. At Aksu he had paid his own debts, at Korla his son's debts, and had wound up by bringing the latter gentleman along with him at my expense.

I did not want to be too severe upon him, especially on a day which had ended so agreeably for me; besides, I was not free from reproach myself for putting the temptation of such a large sum of money in his way. I condemned him to be dismissed from my service, and the sentence was to take effect on the following day.

Strange beings, those Mussulmans! You never can be quite sure of them. The very men who had accused Niaz Hadji now came to me to intercede for him, begging me to keep him, even if it were only to cook the other men's food. But no; I had pronounced judgment, and would not alter it, although I felt truly sorry for the poor old man, Mecca pilgrim though he was, especially as he had formerly served Przhevalsky. I promised to forget the affair, and when he left us gave him half a yamba to stop his tears and help him tide over the winter. This was the end of his "story," and no doubt he thanked his stars that he had got off so well.

The next thing was to get the camp settled down, and to

organise a fresh caravan for the next expedition I contemplated. This took up three days, the 9th, 10th, and 11th of December. I sent Khalmet Aksakal to Korla to buy candles and sugar, and sailcloth for various purposes, and then bade him go on to Kara-shahr, and buy two Mongolian *kibitkas* (tents) and five mules, as well as change some silver ingots into small coin, that is to say into tengehs* of Yakub Beg's period, which are still current between Korla and Charkhlik, at the rate of 21 to a sär (3s.). I also sent along with him Musa Ahun to bring back the things Khalmet bought at Korla, and gave the latter my budget of letters, with instructions to send them on to Kashgar. The writing of these also kept me very busy.

It was now time to send back the four boatmen to their distant home in Lailik, and as they had behaved so well, and always been such pleasant fellows to deal with, I doubled their wages and gave them in addition enough to pay their expenses all the way home. They were deeply touched, and with tears in their eyes recited their *Dua!* and *Allahu akbar*; and really I too was quite sorry to part from them, they had proved themselves such capital fellows. It was arranged that they should accompany the Aksakal on foot to Korla, where he was to buy them good horses so that they might ride the rest of the journey. I never heard anything more of them, but trust they reached home in safety.

Notwithstanding this serious diminution in the number of my employés, the camp was still the scene of considerable life and bustle. Islam Bai now became karavan-bashi; and he and the two Cossacks were my principal assistants. Parpi Bai I appointed to look after the horses; when they did not require his attention, he amused himself with hawking, and fed his hawks upon live poultry, anything but an edifying spectacle. Turdu Bai and Faisullah took charge of the camels, one of them being always on watch whilst the animals were out grazing. A fine old fellow from Aksu, sixty years of age, but frank and happy as a boy, Kurban by name, acted as errand-boy, taking the horses down to water, and carrying out his meals to the man who watched the camels. Ördek, a Lop-man, and a first-rate fellow, who had an exceptional knowledge of all that region, was engaged, amongst other things, to do labourer's work about the camp, such as carrying water for cooking purposes, gathering

* See the table of monetary values, p. 40.

dry wood in the nearest forest, which the camels afterwards fetched in, and getting in provender for the horses. Although we chopped a hole through the ice in the little harbour, and always kept it open, we made a practice of taking our drinking water and water for cooking from the middle of the river, where there was always a fresh, pure current. The begs of the neighbourhood arranged that their Lop-men should sell us fodder for our animals, and the first day or two they brought in no less than a thousand bundles of clover and a thousand bundles of straw, which they let us have at the current rates. Finally I engaged a smith, and the first thing I set him to do was to help Sirkin make me a pair of skates. My idea was to use them for travelling across the lakes I have spoken of; but they were not sufficiently well made to allow of my doing anything more than pottering about close at home.

The camp was continually visited by troops of Lopliks, or Lop-men; for no sooner did our neighbours learn that we had settled in their country, and founded a little village in the wilderness, than they began to make pilgrimages to visit us, and they never came empty-handed; besides which I gleaned a good deal of useful information from them. Thus people were coming and going unceasingly, and from my tent on the ferry-boat, where I sat at work, I heard an unbroken murmur of voices as from a busy market-place.

My men's tent was erected underneath the only poplar there was in the camp, and behind it all the camel-loads were packed up on the framework just as they had been lifted from the animals' backs. The cook carried on his operations over a fire in the open air, surrounded by a big barricade of fire-wood, which was continually being added to as the winter advanced. The camp was guarded by five watch-dogs which the men had brought with them from Kuchar and Korla. Two of these were greyhounds, capital dogs, and very affectionate. I christened them Mashka and Taigun, and they soon became prime favourites. They were exceptionally handsome beasts, big-boned, tall, and white coloured, with very short hair. For this reason they were very fond of being near the fire; while at night they slept in my tent in coats, or rather bags, of white felt, which I had specially made for them. It was very comical to see how cleverly they learnt to creep under these coverings without help from anybody, and how grateful they were, and what sighs of comfort they breathed, when I tucked them snugly in. But on the field

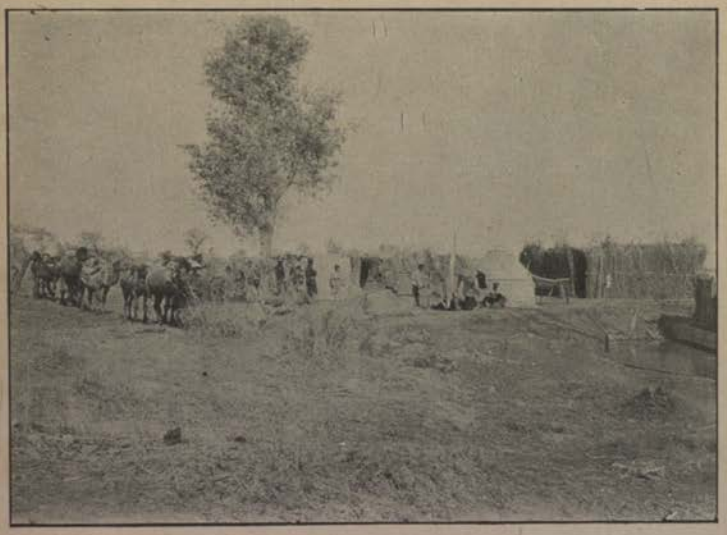
of canine battle they were unsurpassed, and kept all the dogs of the neighbourhood in a state of terror. Nor have I ever seen animals that waged battle in a cunninger way than Mashka and Taigun. They would snuffle about their antagonist until they got an opportunity to seize a hind-leg, whereupon they would swing him round, and drag him away at such a pace that he very soon went head over heels, and when he got up, he invariably fled, howling and limping on three legs. At feeding time not one of the other dogs durst look at a piece of meat until after these two were fully satisfied. They were excellent company, and made a good substitute for the first Dovlet that died; but alas! their days too were numbered.

After they came into the camp I cannot say that Yolldash exactly fell into disgrace; it was rather that he withdrew into private life, and never ventured inside my tent when the new-comers were there. But he always slept faithfully outside it, and when I stepped out and patted him, he jumped and barked with delight. Yollbars ("the tiger") was a gigantic dog of a dark brown colour, a son of the Lop jungle with wolf's blood in his veins. He was kept bound by an iron chain close to the camel-loads, and was so fierce that nobody ever ventured to go within the radius of his tether. He was a perfect model of a watchdog, a sort of Knight of the Deadly Fangs; but even with him I soon became good friends. Yollbars was an important member of our caravan, and afterwards accompanied us on the road to Lassa; and when, two years afterwards he disappeared without leaving a trace behind him, he was greatly missed by everybody. I love dogs; they take the keenest interest in everything that happens in and to a caravan, and never shirk their duty.

When I stepped out of my tent on the morning of the 10th December, I was surprised to see the wooden framework of a house standing ready fixed on the bank. This excellent idea was due to the beg of Yanghi-köll, who had "commandeered" his people, procured the beams, and begun the work at daybreak. The framework consisted of upright posts, narrow spars, and laths, strongly bound together with withies and ropes. Later in the day it was provided with walls, consisting of bundles of reeds set up on end all round it, and the roof also was made of layers of reeds. The method of construction was that common throughout the Lop country, and when finished it was quite an idyllic dwelling, and was even large enough to be divided into two

Our Winter-quarters at Yanghi-köll. The men, going from left to right, are Kader, Turdu Bai, Kasim, Chernoff, Parpi Bai, Sirkin, Niaz Hadji, Khalmet Aksakal, Islam—the last five kneeling—and behind them Faisullah, Palta, Musa, and others.

fair-sized apartments. The idea was that one of these should be used as my living room, while all the baggage was stowed away in the other. However, I remembered what once happened to Schweinfurth, who lost the collections and notes which it had taken him years to gather, because he stored them in a hut of an inflammable character. I preferred therefore to leave my stores outside in the open air, though I took the precaution of covering them down with felting and sailcloth. Had it been my intention to spend the whole winter at Yanghi-köll, I should of course have had a complete and comfortable house built entirely of wood, and put into it the windows of the dark room



Tura-sallgan-uy.

which I had on board the ferry-boat; but I had other plans in view. This camp was a first-rate place, but I only spent a few days there on three separate occasions; and it even acquired a certain degree of fame throughout the Lop country. The Lopliks bestowed upon it the name of Tura-sallgan-uy, that is the "House built by the Great Man," and they assured me that the name would persist to all time as a constituent of the geographical nomenclature of the neighbourhood, just as a certain spot on the Kunchekkish-tarim is called to this day Uruz-sallgan-sal, or the "Russian built a Ferry-boat," because Kozloff once crossed the river there on a raft of dry tograk-stems.

The hut was eventually overtaken by the fate that comes to all the perishable things of earth. Next summer when the floods came, they swept it away, and along with it destroyed both our little harbour and pier and the poplar tree which stood close beside it; but by that time we were gone, and our Penates transferred to higher and safer ground.

How peacefully these few days passed at Tura-sallgan-uy; I was no prouder when, as the guest of His Majesty Shah Nasr-ed-Din, of Persia, I trod the mirrored halls and marble salons of Emaret-Sepa-Salar than I was within the kamish walls of this airy domicile in the land of Lop, where the wind whistled its melancholy, never-ending funeral marches through the stalks of the reeds.

We also built for our eight horses a roomy stable of similar materials, leaving one long side of it open to the camp. Along the other ran the manger, that is to say, two canoes, out of which the horses ate their maize and hay. Further, we bought more poultry, as well as some sheep and cows, which gave us a supply of milk. Thus I speedily gathered about me a farmyard, which, although not exactly a model of its kind, was at any rate the most comfortable and the most delightful of any I have ever had to do with. The space between the huts, the tent, the stack of camel-loads, the "kitchen," and the little harbour formed an open courtyard, the market-place of our village, and in the centre of it a fire was kept burning night and day. This was the place of honour, the place where carpets were spread and guests received; it was our "club." But although our fire was not allowed to go out until May of the following year, it was not tended by vestal virgins, but by bearded barbarians. It was the duty of our night-watchmen, who were relieved every second hour, and looked after by the Cossacks, to replenish the fire; in fact during the cold winter nights they generally sat beside it when not making their periodical rounds.

Ever since my arrival I had been trying to gather information about the desert to the south-west; but the knowledge which the natives possessed of its secrets really amounted to very little. That gigantic wall of sterile sand-hills which stretched alongside the right bank of the river had for me an attraction, a fascination there was no resisting. Yet one thing I felt perfectly sure of, and that was, I was going to venture a perilous assault upon their fortifications by crossing the Takla-makan Desert at its widest part. But as I have said, I could glean very little infor-

mation of value about it. What astonished me most was the horror with which the people spoke of the desert. Their usual names for it were simply Kum (Sand) or Chong-kum (Great Sand), though also Shahr-i-Kettek-kum (Town in the Dead Forest Sand), this last name being derived from a legendary town which was said to be buried in its interior. For a man to lose himself there, they regarded as the worst evil that could by any possibility happen to him. Nobody had ever been far into the desert, neither the camel-hunters of former times nor the gold-hunters of the present day. The farthest they ever ventured was two days' journey from the river; then, overwhelmed by the terror of that awful sand, they always hastened back. If we were so foolish as to try to cross it—well, we were committing sheer suicide, for we should never come back again. But I quieted their fears, telling them it was not the first time I had dared to beard the lion in his den.

To the south-west of Tura-sallgan-uy there was a break in the line of the sand-dunes, and through it, they told me, ran a track to the basin of Bash-köll, in front of which was a village called Yanghi-köll-uy, where several of our purveyors and new friends lived. The little information I did obtain about the desert only whetted my desire to investigate it. Beyond the lakes, they told me, and in the line of their longer axes, stretched several bare, open depressions, resembling the beds of dried-up lakes; these, according to the natives, were formed by the north-east wind sweeping the sand away. They called them *bayir*; but nobody was able to tell me how far they extended into the desert. All they could say was, they had always heard that many hundreds of years ago there lived, a long way towards the south-west, a heathen race, ruled over by one Atti Kush Padishah. Holy imams had gone there to preach the faith of Islam, but the people refused to listen to the new faith; so the imams cursed them, and invoked God's vengeance upon their country, and it rained sand for several days, until the country, and all its inhabitants, and all their cities, were buried under it.

Before making a definitive start, I decided to undertake a short trip for purposes of reconnaissance, and accordingly I called my people together round the fire in the evening, and issued my orders for the following day, the 11th December. They were to lead across the river the camels I proposed to take with me, to prepare the requisite supplies of provisions

and fodder, and to keep open the communication between both banks as best they could. During my absence the hut was to be made as comfortable as possible, so that it might serve as a dwelling-place. They were to divide one of the big apartments, namely that which stood next the river, into two smaller ones, and the inner of the two was to be provided with a double wall of reeds, as well as lined on the inside with felts, to shut out the draught. The floor was to be strewn with reeds and carpets, but in the middle of the floor they were to make a fire-pit, and in the roof immediately above it a hole for the smoke to escape by. All this was to be done by the time I returned; the truth was I found my tent too cold, with the temperature at 18°.0 to 20°.0 below zero.

It was, however, by no means an easy matter to get the camels across the river. For the first thing, we were mistaken in supposing the ice bore. A violent wind had rent apart the seams last frozen; then they froze to again during the night of the 10th December, but not sufficiently to bear the weight of a camel. To have made the animals swim across would have been to kill them. The only way out of the difficulty was to transport them across on the big ferry-boat, yet she was held fast as in a vice. However the Cossacks were not to be beaten. They gathered people and chopped a passage-way for her through the ice, thick as it was. Then, at a point in the river immediately above the camp, where it was only 102 feet wide, and where there was open water right across except for a narrow fringe along the right bank, they stretched a rope four times backwards and forwards across. The depth exceeded 28 feet, and the current flowed at the rate of $2\frac{1}{4}$ miles an hour. This happened to be the very last place which became permanently frozen. Then by means of the rope the men hauled the ferry over, carrying one camel at a time on the after-part. As soon as they were all safely across, they were led away to the nearest pasture.

In the afternoon we were honoured by the visit of a Chinese *siah* or secretary. He was sent by the amban or governor of Kara-shahr to ask after the state of my health; but in reality he was a harmless spy, sent to find out what sort of a traveller I was. Late in the evening we had another visitor, namely, my old friend and former host, Naser Beg, of Tikkenlik, who stayed all night, and gave me some useful information. For one thing he told me "a Russian" had come to Charkhlik from

Dung-khan (*i.e.*, Sa-chow), and would be with me within a week. I suspected this was not a Russian, but the French traveller, M. Bonin. He also reported that the lakes of Avullu-köll, Kara-köll, Arka-köll, and so forth, which I discovered during my former journey, still remained about the same size. He told me too that in the days of his forefathers begs had come from Turfan to exact, on behalf of the Chinese, tribute of otter skins from the inhabitants of the Lop country. The route these envoys used to take ran to the east of the Bagrash-köll, over the Kurruk-tagh and the Kum-daria, then across the Ilek (or Koncheh-daria) at Turfan-köbruk, and so on to Kara-köll. This we know from Chinese sources actually was the case. Otters (*kama*) do frequent the lake of Chivillik-köll and several of the other lakes in that locality; but so far as I could ascertain they are not present in the Kara-koshun. This difference is important and significant; it suggests that the northern lakes are not in connection with the southern lakes, but are an entirely new formation. The otters are caught on the ice after a snow-fall; for although the fall of snow in these parts is very slight, it is nevertheless sufficient to show which way an animal has gone. When the hunter has tracked his otter to a hole, he waits until the creature comes up again from his fishing, and stabs him with a kind of fish-spear (*senjkak*), or catches him in a net the moment he pops his head above water. If there happen to be several fishing holes, each hole is trapped and watched; but the sport is never indulged in unless there has been snow.

About two years previously Naser Beg had been at Tuzun-chappgan, and from a hill close by had observed a cloud or mist (*bulut*) about a day's journey to the north-east; he thought it arose from some unknown lake to the north of Kara-koshun. It was his opinion that it was the lake into which the Kum-daria, the present dry river-course which extends along the foot of the Kurruk-tagh, formerly discharged its waters, a conclusion which showed sound judgment, and which, so far as I was able to ascertain subsequently, was perfectly correct.

All this and a good deal more I was told by the fat and jolly beg, and I let his words sink into my memory; nor were they without influence upon my subsequent plans.

CHAPTER XV.

RECONNOITRING IN THE DESERT—M. BONIN.

THE weather on the 12th December, the day fixed for the beginning of the excursion, was not at all inviting; it was blowing hard from the south-west, and we became chilled to the bone the moment we stepped outside of either tent or hut. The wind swept through the gap of the Bash-köll as if it were being pumped through a funnel, and the dense banks of clouds which obscured the sky tended to make the day still colder. The Cossacks were dressed in furs like Arctic explorers, and each carried a hunting-piece. Besides them, Faisullah, Ördek, and Pavan Aksakal (the White-bearded Hunter) also took part in the trip. The last-named, a big, good-natured old fellow from the village of Yanghi-köll, was one of our best friends in this locality, and did everything in his power to serve us. The caravan consisted of only four camels, which we took turns about in riding. After loading them up on the right bank, we set off for the village of Yanghi-köll and the canal of Bash-köll. As this last was cut off from the river ten years ago, its water was now salt; we therefore took with us a supply of ice for drinking and cooking.

The village, which consisted of 20 families, used formerly to stand on the canal of Yanghi-köll, but eight years ago eleven of the inhabitants died of small-pox, after which the survivors flitted to the mouth of the Bash-köll, carrying the old name with them. When a man fell ill of the small-pox, everybody near him fled, leaving the sick man to his fate. Pavan Aksakal was the oldest man in the little community, and cleverly controlled the fishing in the lake.

After leaving the village we continued along the south-east side of the Bash-köll, which was frozen all round close in shore, hard enough to bear the weight of a man. Further from the shore the ice was very thin and precarious, while in the middle of the lake were several large open sheets of pure blue water,

a striking contrast to the desolate yellow sand piled up all round the shores. The cause of the lake not being entirely frozen over was the slight admixture of salt it contained. There were a few ducks and swans floating on the open reaches. This lake was barely 12 miles long, and seldom more than $1\frac{1}{4}$ miles wide, in two or three places even only half that width. It stretched due south-south-west, and resembled a fjord penetrating the sand-dunes, which at its extreme end were barely lifted above the horizon. The lake did not, however, at that end quite reach the base of the sand-dunes, but was separated from them by a strip of gently sloping ground, consisting of sand and silt, very soft in summer, but at the time of our visit frozen as hard as a stone. If the channel, which formerly connected the lake with the river, were to be opened again, this low-lying strip of soft soil would be inundated to the depth of 5 or 6 feet. The immediate extremity of the lake was girdled by a belt of luxuriant reeds, some 25 to 50 yards broad, while close at the foot of the dunes were patches of tamarisks. On the east side of the lake, along which we were travelling, the dunes descended at the steep angle of 33°, but on the opposite side they resembled a giant staircase, coming down by terraces. This difference was accounted for by the east wind, the wind which predominates throughout the whole of the Lop country. Except for an occasional poplar, more rarely a small grove, the landscape wore a strangely uniform aspect.

As there was plenty of firewood at the southern end of the lake, we halted there. Just before dark we collected a big pile of dry tamarisk branches, and, gathering round the fire in the happiest frame of mind, ate the excellent dinner of partridges, rice-pudding, and tea which the Cossacks had prepared, and then, after I had written out my notes for the day, we rolled ourselves in our furs and were soon asleep, the sky above being our only covering.

The next morning the earth was white with rime-frost, which indeed lay so thick that the dunes looked as if they were covered with snow. The thermometer showed −8°.0 C. or 17°.5 Fahr., and as the lofty dunes on the east side of the lake shut out the rising sun, we felt it pretty cold.

Beyond the lake the sand went up by steps, which were not at all steep, and then quite suddenly all vegetation ceased. From the top of the ascent we observed to the south-west a *bayir* or depression, which was probably half a mile long and a

quarter of a mile broad, moist and barren in the middle, where it showed indications of salt, and with thinly-scattered clumps of grass along the sides. Its general shape was that of a cauldron, for it was shut in all round by a ring of steep, gigantic dunes, and resembled the bottom of a former lake, which the drift-sand had carefully shunned. Seeing how these bayirs are so freely exposed to every wind that blows, it is amazing they were not long ago filled up with sand.

To the south and south-west was nothing except a sea of sand, with sharply-defined protuberances, the culminating crests or ridges of the accumulations of individual sand-dunes. It was like looking out over the waves of the wild Atlantic, except that they were waves of stationary sand, not of moving water. One naturally inferred that there were numerous bayirs hidden in the valleys between. The protuberances or crests of the dunes lay closer together in this neighbourhood than they did in the western parts of the Takla-makan Desert, and very often the dunes were steep on both sides, showing how changeable the winds are. The prevalent wave-formation proved, however, that the east wind is the stronger, and blows more frequently than any other wind.

Having obtained this general survey of the region and its contours, and ascertained that this point was not altogether favourable for making a start from, seeing that the bayir of Bash-köll, with its easy and level floor, only extended a short distance, I decided to choose some other point of departure, and to return now to Tura-sallgan-uy by way of the lake of Yanghi-köll. Accordingly we turned due east, and so had the steep slopes of the dunes against us. Before, however, we could face all these giant stairs, we were obliged to make a long detour in order to get the camels over the stupendous "wave," or ridge, which parted the two lakes. The animals did not feel at all sure of themselves on the uneven surface, and grew terrified. Upon reaching the summit of the pass two of them went over it on their knees, so as to be nearer to the ground in case they should fall.

Whilst the caravan continued on further, Pavan Aksakal guided me to the top of a lofty dune, some 350 feet in height, which commanded a splendid view of the whole country, and from which our camels down below looked no bigger than beetles. South-west of Yanghi-köll I noted three big bayirs, separated by considerable masses of sand, which were like pits in the billowy surface—islands amid the ocean of sand. North-east

lay the lake, covered with glittering greyish-blue ice, and beyond it the immense wall of sand which rose between Yanghi-köll and the right bank of the Tarim.

After having with some difficulty piloted the camels over a formidable ridge, we went down into the big oblong bayir which lay next the innermost part of the Yanghi-köll. The bottom was entirely free from sand, and consisted of concentric belts of different formation. The outermost ring, next the foot of the dunes, consisted of powdery dust, into which the camels dropped a foot or more; then came a girdle of marshy soil, and inside that a ring of salt. The north-eastern part of the bayir contained one large pool and several small ones, all with intensely salt water. Beyond this bayir, and still towards the north-east, followed a patch of reeds six to seven feet high; there we found a suitable spot to camp in, with plenty of dry wood.

Our bayir was separated from the lake by a sandy neck of land, about 100 feet high. At its foot were some springs, the water of which was fresh when it first bubbled out, but grew salt after it accumulated at the bottom of the depression. Viewed from this sandy ness, the landscape formed a particularly attractive picture. The Yanghi-köll was so long and so straight that its northern end, next the river, where there was no sand, was invisible. For all we could tell, we might have been standing at the head of a fjord, with the open sea behind the projecting headland, equally as on the shore of a desert lake embosomed amid gigantic sand-dunes. But while the north-west corner of the lake was lit up by the rising sun, the steep sand-walls of the south-eastern angle were plunged in deep shade, and flung their shadows far out across the bright grey-blue surface of the lake. Here the vegetation was scanty, whereas on the diametrically opposite shore it was more fully developed. About a dozen scattered poplars in all might have been counted on both shores together. The water was fresh, and was reputed to be 5 fathoms deep or more. The lake had been cut off about two years, and was to continue in that condition seven or eight more, all for the sake of the fishing. But a few open places near its north-eastern shore indicated the presence of subterranean springs. These, however, did not yield sufficient water to compensate for the loss by evaporation and other causes, and that the lake was shrinking was evident from the ice, for it was higher at the margins than in the middle.

Our route lay to the north-north-east along the lake side.

As we advanced we found the lake diversified by lagoons, peninsulas, and islands, but these existed nowhere else. In respect of size, shape, and general appearance, the Yanghi-köll was exactly like the Bash-köll, in that it resembled a fjord. Sometimes the track took us down upon the ice, which was as pure and transparent as glass, and the water underneath it as bright as crystal. At a depth of two or three fathoms the minutest object was plainly visible at the bottom. At first we had a sort of feeling that we were actually travelling on the water itself. The picture at the bottom was like a scene in an aquarium—algæ as motionless as coral, and big black-backed fishes which hung without movement, half asleep amongst the clusters of algæ. When the Cossacks awakened them out of their semi-dormant condition by stamping on the ice, they gently moved their fins, and calmly and slowly glided into the depths below. The smaller fish dashed along in shoals underneath the ice close to the shore. There the ice was no less than four inches thick, but a hundred paces from shore it was not more than one inch thick. I have never seen a more magnificent sheet of ice. I was almost tempted to stay beside it all winter, simply for the sake of skimming along its smooth surface in a home-made ice-yacht; it would have been better than risking my life amongst those awful sand-dunes. Continuing alongside the channel which connected the Yanghi-köll with the Tarim, we came to the latter, and, advancing along its right (western) bank, eventually reached the point from which we started. There we found our ferryman awaiting us with his big boat, and were received by Islam Bai and Parpi Bai.

On the 15th December I sent Chernoff, Islam, and Ördek on horseback to examine the Seit-köll and the country to the south-west of it, to see if it would afford a suitable starting-point for our contemplated desert journey. They executed their task both quickly and well. Chernoff and Ördek, who took part in both reconnaissances, were consequently in a position to institute comparisons as to which was the better route. After an absence of 36 hours they returned, bringing with them a rough route-sketch of the country they had traversed. My scouts assured me that they nowhere saw sand-dunes like those we had encountered beside the Yanghi-köll; also that the accumulations of sand which divided the depressions from one another were passable even for horses. From the furthest point they reached towards the south they saw a string of bayirs stretching onwards in the same direction, that is towards the south-west. This would

make at all events, the first few days' journey very much easier. Early though the season was, the sand-dunes were already white with rime-frost, and Ördek observed that if we ran short of water, we should be able to quench our thirst with the rime. I suspected, however, it was only in the vicinity of the river that the rime-frost was so copious, and that it would decrease as we penetrated into the desert.

Once more I enjoyed a couple of delightful days' rest at Tura-sallgan-uy. Meanwhile the tent was fitted up and converted into a comfortable dwelling. It will be remembered that the inner half of it was to be divided again; this was

Native Huts at Aktarma, a Village near Yanghi-köll.

now effected by letting drop a thick red felt carpet from one of the beams which supported the roof. Although I transferred my boxes, instruments, writing-table, etc., to the innermost room, I found it impossible to keep it warm, and I durst not introduce a stove amongst all that dry straw; one spark would have been enough to set it ablaze. To overcome this difficulty I opened up a doorway through the back wall of the hut, setting up the tent immediately outside it, and there installed the stove. The outer side of the tent was stitched up, and earth was then banked up against it all round to keep out the draught. After that I slept in the tent again. In the outer division of the hut we kept a variety of bulkier stores, such as saddles, my skiff and its belongings,

and various other things. Thus I dwelt in a three-roomed house, and felt so comfortable that it demanded a good deal of resolution to quit it for a cold, perilous, and wearisome march through the desert.

But who could this Oruz Tura (Russian lord) be who was said to be approaching the region where we were? I knew that M. Charles Eudes Bonin had left China, intending to cross the continent *viâ* Sa-chow, Lop, and Urumchi. Surmising that the mysterious traveller might be he, I sent a special messenger to meet him, with an invitation to come and dwell with me. I entrusted the message to Parpi Bai, thinking M. Bonin would be interested to meet a man who had accompanied the Prince of Orleans and M. Bonvalot in their journey across Tibet, and who had witnessed the murder of Dutreuil de Rhins.

Parpi Bai returned on the evening of the 16th, bringing an answer couched in the politest terms of French amiability. M. Bonin, for it was indeed he, had reached the *örtäng* or rest-house of Jan-kuli, some six miles north of our village, and so, taking horse, I rode thither by the light of a brilliant moon, and found the distinguished traveller in a room filled with smoke from a fire in the middle of the floor, surrounded by his Annamite, French-speaking attendants.

Nothing is more delightful, when you have been travelling a long time in a desolate region, than to encounter a European. In this case the pleasure was doubly enhanced because M. Bonin was a quiet, yet bright and charming, man and a scholar, and it was quite a treat for me to sit and listen to his remarkable experiences and hypotheses. He had discovered an old pilgrim-route across the Astyn-tagh into Tibet, and an ancient highway which led from Sa-chow towards the quarter where the old lake of Lop-nor was situated. With regard to the variability of this lake-basin, he entertained the same ideas that I did.

M. Bonin gave me a capital supper, and after breakfast the next morning we rode together to Tura-sallgan-uy, where we spent an unspeakably pleasant and agreeable day together. My French guest examined with the greatest interest our little village and all its "lions"—the huts, the fire-place, the harbour, with its frozen-in boats. We went over together all the sheets of my map of the Tarim and its innumerable windings, and after the moon got up we had a little sail amongst the drift-ice.

But as the evening was cold, I invited my guest into the tent, and got up a roaring fire in the stove. Then my men served up

M. Bonin and the Author at Yanghi-köll.

a Lucullan banquet, embracing everything our larder and store-room were able to offer. The chief dishes were Swedish "Emperor" soup, Tatar *shisslick* (mutton grilled on a skewer), and Turkestan *ash* or rice pudding, followed by a number of canned fruits and so forth, washed down by the only bottle of wine my cellar afforded — a bottle which in an unguarded moment Colonel Saitseff had smuggled into one of my trunks. The banquet, which was also honoured with music, lasted on into the small hours of the morning; and then, while I took a shakedown in the airy "salon," M. Bonin turned in in the tent. It was one of the happiest days I ever spent in the heart of Asia.

Next morning, the 18th December, M. Bonin's far-travelled Chinese cart was driven into our courtyard. The moment was come to part, he to return to his own country, I to disappear into the trackless wilderness of the "desert ocean." He had his task behind him—he had done his work; whereas mine lay before me —a host of enigmas shrouded in an impenetrable mist. When everything was ready, M. Bonin and his attendants were photographed standing under the big Chinese lantern which hung at the end of a post fixed in the middle of the courtyard. The French traveller wore a long red cloak, with a *bashlik* (hood) of the same colour, and looked like a Lamaist pilgrim. A warm shake of the hand, and "Au revoir!" He mounted into his cart, and disappeared behind the bushes, and I was once more alone; but I look back upon our meeting as one of the pleasantest episodes in the whole of the journey.

The river was now frozen so hard immediately above our camp that it bore a man on horseback, and in consequence of the vast quantities of water which in this way became fixed at the bottom of the river, the level steadily dropped, and the current in the open 16-foot channel in the middle was scarcely perceptible. The melting of this solid mass of winter ice occasions in spring a pioneer flood, which the natives call *mus-suyi*, or "ice-water"; it was this we seized advantage of in the following year to get our big ferry-boat farther to the south-east.

The 19th December was the last day for a long time to come that we were to spend at Tura-sallgan-uy, and it was wholly occupied with preparations for the trip across the desert. The depression which began with lake Tana-bagladi-köll was pitched upon as the starting-point.

For the new expedition I appointed as caravan-bashi Islam Bai, the faithful and experienced companion of my former

journey across the Takla-makan Desert. The other participators in the march were Turdu Bai, Ördek, and Kurban. We had with us seven camels and one horse, and of the dogs I chose Yolldash and Dovlet II., for I did not wish to compel the sensitive greyhounds to sleep in the open air in the bitter winter cold. A supplementary caravan, with Parpi Bai, Faisullah, and a Loplik Khodai Verdi and three camels were to go with us the first four days, and then return.

With the view of safeguarding my travelling-cases against fire, I had them taken out of the hut and carried back on board the big ferry-boat. My meteorological observatory still remained on the roof of the dark-room, and there the instruments continued to work all through the winter. I had already instructed the Cossack Sirkin how to use them, and now left him in charge of this important branch of my work; besides which, he was appointed chief and captain of the whole camp. It was with an aching heart that I left my two Cossacks behind; but they were necessary for the protection of the camp. They lodged in their own tent, transferring to it the stove, and I gave them two yambas (£15) to meet all expenses, besides a superfluity of provisions. They were made responsible for the safety of the camp and the protection of all the animals I left behind me, amongst them being three young mules, which I had recently bought at Korla for the extraordinary cheap price of only 70 sär (£10 10s.) for the three, and the animals held out for two-and-a-half years. Altogether seven men were left behind at Tura-sallgan-uy, and there they spent a peaceful winter.

Considering the heavy sand we were to march across, I had the loads made as light as possible, and to that end cut down our stores, etc., to the lowest possible margin. We took rice and flour for ten days, ready-baked bread sufficient to last a fortnight, and *talkan*, or roasted flour, which is eaten just as it is, also for a fortnight. For my own use I had in addition a few cases of tinned foods, tea, sugar, and coffee, while the men carried Chinese cube tea. That is to say, we were provisioned only as far as Cherchen, for there we should be able to renew our supplies.

Besides these things, I packed into the only box we carried with us the alt-azimuth and its stand, meteorological instruments, levelling glass, kodak, itineraries, measuring-tape, test-tubes, maps of East Turkestan, and a host of small articles and my clothes. The chronometers I always carried in my pocket.

I was awakened at 7 o'clock on the morning of the 20th

M. Bonin.

December by Islam, who came to tell me there was a violent storm blowing from the south-west; did I intend to start? I at once saw that he was right, for the tent bulged like a sail, and the smoke came "pouthering" out of the bottom of the stove chimney. But I had fixed upon that day for starting, and it is not wise to put off a thing when you have once made up your mind to do it. Hence, whilst I ate my breakfast, the baggage was conveyed over to the other side of the river, where the begs of the neighbourhood and their people came to see us set out on an expedition from which they fully believed we were destined never to return.

The camels were led over the ice on a sanded track and loaded up. My box of instruments, bedding, and cooking utensils made one camel's load; the men's clothing and the larger packages of food a second; the third camel was laden with wood cut into huge blocks; the fourth carried maize for the animals themselves; and the three last were laden with blocks of ice, packed into *tulums* or goat-skins. The three reserve camels carried heavy loads of wood and ice. All the travellers were well provided with winter clothing and heavy furs.

III.

Across the Takla-makan Desert.

The Land of Perpetual Twilight.

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CHAPTER XVI.

TRAVERSING THE BAYIRS.

OUR route lay at first between the river on the right and the sand-hills on the left, and led due west amongst open brushwood and thin kamish-beds. However, we soon left the Tarim, turning in towards the sand and striking along the south-east shore of the lake of Tana-bagladi. This, both in form and general appearance, resembled the lakes I have already described, except that it was considerably shorter. Upon reaching its southern extremity, we halted, cut four small holes in the ice, and let the camels drink all they possibly could hold; this was the last water they would get for a long time to come. And the sagacious animals seemed to understand what lay before them, for they drank and drank, as though they never meant to stop. The little white horse also—he came from Kashgar—as well as the dogs, and the men, all had a good drink; for, although we carried a supply of ice with us, it might easily happen that later on we should be pinched for the precious fluid. We made our first camp beside a frozen saline pool on the other side of the dunes which shut in the lake on the south.

With the idea of getting as much shelter as we possibly could, we made a big clearing in the heart of the reeds, then lighted a fire of dried grass, and fed it sparingly with chips from one of the wood blocks; but our only covering was the sky. Parpi Bai, who officiated as cook, washed the rice, and put a piece of lard into the pan, then, when it began to splutter, he added small pieces of meat, onions, and vegetables, and finally poured the rice in, and on the top of all a can of water. That done, he covered the pan with a lid. The whole was left to boil until the water had entirely disappeared, partly as steam, partly through absorption by the rice. Such is the orthodox way of preparing the regulation *ash* or Turkestan rice-pudding.

The next day, thanks to the favourable nature of the ground, our march proved in all respects satisfactory. Our route was determined entirely by those remarkable bayirs, which extended in one long line 35° west of south. Shortly after starting we crossed over a low and easy transverse ridge or threshold, and went down into bayir no. 6. At its lower end—that is the end which came nearest to the river—were a few saline pools surrounded by incrustations of salt. The second and third bayirs were both smaller; but the fourth reassured us, for it was as big as the first three put together.

All these bayirs appeared to lie at one and the same level, and were perfectly flat, as well as separated from one another by short belts or necks of sand. Fortunately for us the sand of which they were built up was not steep. The bottom of the bayirs was seldom hard. In these early ones it consisted of fine moist dust, into which the camels sank fifteen or sixteen inches at every step, so that our progress was slow and tiring. In fact, it took us two minutes to travel 110 yards, so that we moved at the rate of less than two miles an hour. The leading camel had the worst of it, for it fell to him to trample a path for those that followed; while the last of the string had almost a well-beaten path to walk on. I rode behind the camels on my little white horse, but all the men went on foot, except Parpi Bai, who rode on the top of a load of wood.

In shape all the bayirs resembled one another, and it was soon apparent that they owed their formation to the same physical agencies. Except for the absence of water, they were all exactly like the marginal lagoons of the Tarim. Like the Tarim lakes, too, they were inclosed on both sides by sand; but the dunes which shut them in on the south-east formed a continuous barrier, shooting down into them at an angle of about 33°, whereas the slopes on the north-west side ascended very gently, making it pretty certain that at their farther or western base there was another bayir.

It was of course abundantly evident that the route we had chosen was the only possible direction for us to travel in, since it would take us straight to our goal, the village of Tatran on the Cherchen-daria, a day's journey below the town of Cherchen. It is almost absolutely impossible for even a foot-passenger to travel in that desert either to the east or to the west. Every now and again a tongue of sand jutted out across the level floor

of the bayir; but these were low, and it was quite easy to make a detour round them.

We halted and formed Camp no. II. near the far end of bayir no. 4; though, as there were no reeds to afford us shelter, we were exposed to the full force of the whirling drift-sand. The one all-engrossing topic of conversation, as we crouched round our two modest fires, was, how far did these helpful bayirs extend? For, so long as we were able to travel along them, there was no danger. Upon climbing to the top of the highest dune to obtain a survey of the country around, my eyes fell upon what was little short of an appalling spectacle. Imagine

The Caravan Threading its Way between Mountains of Drift-sand.

an ocean of sand, crumpled into gigantic waves, and suppose these waves to come rolling straight in upon you, and to be suddenly arrested just when on the point of breaking and overwhelming you. You will then be able to conceive the scene which I looked upon—an ocean of stupendous waves—waves not of water, but of loose sand, poised and threatening, and ready to burst and roll onwards again the moment the magic *sesame!* was uttered. According to the topographical results of my former journey, the distance we had to travel to reach Tatran was 177 miles, or almost twice the distance I journeyed when I crossed the same desert from the lakes of the Masar-tagh to the Khotan-daria, and yet the latter had been long enough to

kill an entire caravan. Both Islam and I—we shall neither of us ever forget that journey—realised only too well how perilous an enterprise our present project was.

With the wind blowing keenly from the west, and the air so heavily charged with dust as to convert the broad daylight into twilight, and with the thermometer down at 11°.0 C. or 12°.2 Fahr., I was naturally reluctant to take off my furs. Accordingly during the whole of the two months this expedition lasted, I slept every night, except when in Cherchen, in the open air, and that without feeling the least ill-effect from it. Even thus early we husbanded our chips of wood and lumps of ice.

Parpi Bai was unwell, and I should have sent him back from Camp no. II., only he was unable to walk in his heavy furs, nor could he travel all the way to Tura-sallgan-uy in a single day. We made room for him therefore on the back of one of the camels, and carried him with us. But this was the last of my expeditions in which the poor fellow was to take part; his days were numbered.

The next day we marched 14 miles, mostly along level bayirs, though the sandy isthmuses between them grew both higher and broader as we advanced. The only fault we had to find with our route was that it continued to go 35° west of south. If it persisted in that direction it would bring us into the very heart of the interminable ocean of sand and compel us to cross its entire expanse in a diagonal line to Niya, a task beyond the powers of any caravan, even under the most favourable conjuncture of circumstances possible. On the other hand, it would be folly to abandon the bayirs, for it would be impossible to imagine any ground that could be more suitable for travelling on than they were.

The sheer illimitable accumulations of sand which are spread out over this part of the interior of East Turkestan are arranged in a sort of net-work pattern, and the bayirs of which I am speaking lay inside the meshes. No matter what point on the river we started from, we should of necessity have got into an unbroken continuity of bayirs all running in the same direction, namely, towards the south-south-west. And yet these depressions are subject to important changes even now. As we advanced we found that their bottoms became firmer, and consequently more convenient for the camels, as well as drier, and covered to a greater depth with sand. Then at their edges clay began to show itself in the shape of oblong terraces or

steps, four or five feet high, or even simple cornices projecting through the sand. These, however, did not owe their origin to the erosive force of the wind, but to the action of water; in fact they resembled ancient beach-lines, marking the different levels of lake or river. This view, that the bayirs indicated ancient lake-basins, was borne out by their basin-shaped formation, and the concentric arrangement of the terraces, the belts of soil impregnated with salt (*shor*), ringed round by zones of actual salt—precisely the appearance which the existing marginal lakes of Yanghi-köll, Bash-köll, Tana-bagladi, etc., would assume, supposing they were to dry up.

Nevertheless I was rather disposed to believe that we were travelling along the bottom of an immense inland lake or sea. This view was supported by the general level of the whole of the Tarim basin, by the direction in which the two rivers, the Tarim and the Cherchen-daria, flow, and by the position of the several chains of bayirs; for, as we shall see lower down, each of these chains curved like a bow, while all radiated from a point intermediate between the old Lop-nor and the existing Kara-koshun, or the point where the lowest depression of the whole of the Tarim basin occurs. But the problem is a complicated one, and too long to be properly discussed in this present book; it must be dealt with in a special scientific work.

From the seventh bayir onwards the ground was so firm that we were able to march wherever we chose, though the first six had been so soft and treacherous in the middle that it was quite impossible to travel anywhere except along their edges. In the fifth we discovered traces, about a fortnight old, of a stray antelope, which, however, had returned by the same way it came from the river; and in the eighth made the interesting discovery of bones of the wild camel, though they were now brittle and spongy. In bayir no. 3, by way of experiment, we had dug a well, and found water at a depth of four feet, plenty of it, with a temperature of 4°.8 C. or 40°.6 Fahr., though of an intensely bitter salty taste. Although the ground was moist right up to the surface, it was nowhere frozen, owing to its very strong impregnation of salt.

On the 23rd December we were again awakened by a veritable buran or black tempest, but it came from the north-north-east. The sky was cloudy and the atmosphere so laden with dust that the features of the landscape—if one may apply this description to that abode of desolation and torpor—became invisible at a

few hundred yards' distance, and even those which were quite close to us appeared distorted and spectral owing to the haze. We, the only human visitants that this fearful desert had ever known, were amazed that the drift-sand, which is wont to be shifted in enormous quantities by the tempests of spring, had not long ago filled up these depressions and so raised them to the general level of the desert. But, as a matter of fact, every individual grain of sand seems to travel along its predetermined line with the same undeviating certainty with which the electrical current speeds through its wires. It is the wind which guides them; and the wind, moving close to the earth's surface, is compelled to accommodate itself to the relief of the dunes. Hence, the sand which these wind storms sweep up before them is constrained to avoid the bare places, and to deposit itself upon the slopes of the dunes at their side.

As the day wore on, we several times travelled over soft sand, and two or three times, after crossing one of the sandy isthmuses I have mentioned, failed to strike the next bayir. But it soon became evident that we had got off the proper route, and in the haze were wandering astray on the broad isthmus or neck of sand between the two depressions. We therefore came to a halt, and searched until we found the way back to the proper bayir.

The ninth, tenth, eleventh, and twelfth of these depressions were cauldron-shaped, but so small that they gave us little assistance, especially as they were threaded by a system of low dunes stretching from the north-east to the south-west. Fortunately the sandy isthmuses which separated the bavirs lay very favourable for us, in that they invariably offered an easy ascent, but a steep (33°) descent into the next following bayir.

After we traversed the twelfth bayir, matters began to look serious. We spent a long time struggling to the top of the next sandy lintel or isthmus, for the slope was exceptionally prolonged, and the camels kept stopping more frequently; but at last we reached the culminating crest, and were very agreeably surprised at the prospect we saw before us. Deep down below lay the thirteenth depression, its bottom entirely free from sand, and its farther end swallowed up in the haze. It looked like helping us a good distance on our road. In the middle of it were some solitary terraces of clay, horizontally disposed, which, when seen at a distance, resembled houses and walls. Here, between two of these clay deposits, we halted for

the night; and during the time the cooking-pan and kettles were bubbling and boiling over the fire, we all sat crouching over it. After supper, while the Mussulmans were discussing the prospects for the next day, I jotted down my notes by the light of a candle. In order to make our firewood hold out for the fortnight we restricted ourselves to three billets for each encampment, two for the evening and one for the following morning.

During the night the storm subsided, and when at daybreak I peeped out of my furs, the moon was still bathing our slumbering camp in her silvery white sheen, and the long-drawn breathing of the camels was the only sound which disturbed the silence. It struck me that if the moon only possessed the power to see and reflect in the way man does, she would be not a little amazed at the insignificant insects she saw groping their blind way through that everlasting desert, and with boundless audacity forcing a passage across a part of the earth's surface where man was never meant to put his foot. And then, that night more than all nights again, I really envied her her commanding position in the firmament; for not only did it enable her to see a long way across that sandy ocean in the heart of Asia, but it enabled her to look down upon my home in the far North, whither my thoughts were just then drawn with especial tenderness, for it was—Christmas Eve!

Wearied as we were with our strenuous march through the sand the day before, we all slept soundly, and the sun was already peeping over the crests of the sand-dunes when I at length awoke. Clouds and dust—both were gone as if by magic, and the sandy desert glowed all round us like a lava-flow. The camels always lay closely packed together for warmth's sake; and their sharp-cut shadows were now flung far out over the barren soil. And how strange a soil it was! Hardly like the soil of earth, more like the integument of some other planet.

Soon the camp awoke, the baggage was arranged afresh, though the thinning out had been so thoroughly done there was little else could be dispensed with, for Parpi Bai, Faisullah, and Khodai Verdi were now to return. It was originally intended that Kurban also should accompany them, but he was such a cheerful, pleasant fellow, Christmas without him would have been gloomy indeed, and so he received permission to stay. The men were as glad as I was: it was as though we were all under a spell. Each of them wanted to accompany me through the desert.

We gave the returning party two or three small lumps of ice, one billet of wood, and a few pieces of bread—not very sumptuous fare for Christmas Eve! But then they were to do the return journey in two stages, and were to make for the Seit-köll, the nearest point where water was to be obtained. To know they were in safety was both a relief to me and an advantage to the caravan. Our supply of water would last longer now that there were six lives less dependent upon it. On the other hand, our seven remaining camels would of course have heavier burdens to carry. Yet these would grow lighter with each succeeding day, and nobody was permitted to ride until the loads became very sensibly less.

We rapidly traversed the remaining portion of the thirteenth bayir, which helped us well on the way. The ground was granular, hard, and dry, and covered in places with a thin incrustation of salt resembling rime-frost, which crackled every time we trod on it. Upon digging eight or nine inches down we came upon a thick deposit of pure salt, evidently filling the bed of a desiccated salt-lake. The margins and side-terraces of the depression, which were seldom more than seven feet high, were coated with a perfectly horizontal layer of yellowish red clay, some eight or nine inches thick, and as hard as a stone. Underneath the clay was dust, grey and loose, and sloping outwards.

Bayir no. 14 was of a rudimentary character, and only gave us about one hundred yards that were free from sand; but the fifteenth was really a large one, and towards its lower end was bordered by terraces that called to mind the walls of Chinese fortresses. At its south-western extremity it was shut in by a lofty isthmus of sand. While the poor camels were toiling up this, the wind arose again in the north and soon packed the sky with heavy banks of cloud. The sunshine had brought out the features of the country in sharp relief; now, with its disappearance, the landscape appeared as gloomy as could be, and inspired in us a feeling of hopeless depression.

I led the way on foot, but failed to see any bayir on the other side of the sandy peninsula; and, finally, instead of the exceptionally large bayir which I hoped for as a Christmas box, I discovered that I had missed my way, and was wandering on another of those ill-omened promontories. Nor shall I easily forget the feeling of vexed disappointment which came over me, when from the top of the steep dune, fully 200 feet high, on which I stood, I looked down into bayir no. 16, gaping like a

huge black cooking-pot down below. For the bottom of it was moist and wet, and edged all round by a narrow belt of salt, besides being shut in on every side by lofty sand-dunes. It was like the mouth of hell itself. However, after waiting until the caravan came up, I led the way down the steep sandy slope into the repellent pit at the bottom; and then on we struggled as best we might, keeping as much as possible to the outer margin wherever it would bear us. But after 9½ miles we had had enough, and encamped on the dune which terminated this hateful bayir on the south.

Yet no matter what the difficulties of the day's march had been, everybody's spirits rose the moment I commanded halt. Then, whilst Islam prepared my bed near the fire, Turdu Bai and Ördek unloaded the camels, placing the loads convenient for starting again the next morning. After that the camels were tethered close beside us, the two billets of wood were split up, the fire made, the pieces of ice put, some into the pot and some into an iron pail to melt. Meanwhile Ördek set about preparing the rice pudding. The water in which the rice was washed was afterwards given to the horse and the two dogs; we could not afford to waste one drop. If the camels did not grow too thirsty, the supply we carried with us was enough to last fifteen days, and the wood enough to last eleven.

I have never spent Christmas Eve amid gloomier or more desolate surroundings. The only thing in keeping with that season of gladness was the cold. We however sat crouched together, like bats in winter, round the niggardly fire, watching the last tiny blue flame or two which hopped above the embers. Then we wrapped our furs close about us, to take the sting out of the icy wind of the midwinter night; but the angel of Christmas went on past us, although all our doors stood opened hospitably wide. It was a desert Christmas, and could not have been more dreary had we been at the North Pole.

On Christmas Day the ground was favourable, and we travelled no less than 11¼ miles. Beyond the "Christmas pit" came three small bayirs, followed by a very long one (no. 20), which stretched almost exactly due south for as far as we were able to see. Being in the shade, owing to the steep and lofty wall of sand—close upon 300 feet high—which shut in the bayir on the east, all its features were sharply defined. Its floor was soft and slightly moist, and consisted of fine dark-brown dust, mingled with salt, without a single grain of sand in its composi-

tion. Had the east wind been the only wind which prevailed in that region, it would have been easy to understand the reason for this. But our experience went to show that the prevalent winds during the winter months are the south and north winds; hence it is safe to infer that with time they will fill up all these depressions. The only part of the Takla-makan in which we found firm bare ground during our former journey of 1896 was on the side next the Khotan-daria, that is to say those parts of the desert which lay most exposed to the east wind.

In a bed of hard gypsum in bayir no. 20 we observed the skeleton of a water-bird, which had succumbed whilst crossing this ocean of sand, as well as a dead day-fly (*Ephemeris*), which might well have utilised the brief moments of its existence to better purpose than getting lost in that desert.

At the further end of the bayir we again entered upon deep sand, which steadily led upwards. It is true there were two or three bayirs down below by the side of our route, but they profited us nothing. We meanwhile were marching along the culminating crest of the promontory, where the sand-dunes, running north and south, sloped on the east at an angle of 16°, and on the west at an angle of 32°. The reason we kept to the crest was because it was easier going, owing to the sand there being more tightly packed. All the same the track was in several places so unfavourable that we were obliged to use our spades and cut steps for the heavily-laden camels. Although every man of us was marching on foot to keep himself warm, we were all chilled to the bone by the cutting south wind, which met us in the teeth and never once slackened its energy. We were here witnesses of the effect which the wind has upon the summit of the dunes, in curling their crests over like hanging plumes. Everything was enshrouded in the yellowish grey haze. The sand penetrated everywhere, until it got to our very skin, and gritted between our teeth when we brought them together. Some grains of it even fell out of my old note-book when I wrote down these sentences, two-and-a-half years after the day on which I noted them down.

The men were beginning to lose heart; but I quieted their apprehensions, and assured them that they had nothing to fear. We encamped that night in a little corner or angle between two lofty sand-dunes.

On the 26th December we traversed no less than eight bayirs, but they were all small and gave us little real help, for every time we went down into one of them we had to climb up out

of it again. It pained me to see how all this taxed the camels' strength. For the most part therefore we marched on sand, all on foot, except that I rode about a mile or so whilst traversing the harder soil of the bayirs. In the small depressions that we were now traversing we observed very distinctly various series of concentric rings or desiccation lines, like those which are left round a pool as it dries up.

The sandy isthmuses which separated bayir from bayir con-

A Loaded Camel.

tinued to grow higher and broader, and of course encroached more and more upon the hard, level ground of the depressions themselves. When descending on their southern side, the camels used to stiffen their legs and let themselves deliberately slide down the steep slope. The sand, being loose, gave way under their feet and poured down like a cascade, carrying the animals with it. To this manœuvre the camels soon grew accustomed, and learnt to balance themselves securely, being no longer afraid of the dizzy crests of the sand-dunes. Whether viewed

from above or seen from below, the spectacle of the clumsy brutes glissading down in that way was unspeakably funny.

Islam, my experienced desert pilot, generally led the way, endeavouring as far as possible to steer a course that should keep our zigzag route at the same level. At the top of every crest we stopped to look around us, in the perpetual hope of discovering a fresh bayir; but more frequently we were disappointed, and consequently were obliged to advance as best we could along the crests.

Upon reaching Camp no. VII., I was able to comfort my men with the assurance that we were now well half-way to the old bed of the Cherchen-daria, which, according to the map of the Russian traveller, Roborovsky, lay some 40 miles north of the river's present bed. We still had 2½ camel-loads of ice left, and that would suffice. But there was just a doubt as to whether our firewood would hold out; if it did not, we should have no opportunity to melt the ice. We gave the camels the straw stuffing of one of the pack-saddles to eat.

On the 27th December we made an early start. The men's spirits were damped by the interminable desert; they thought it would be best to hasten on to more hospitable regions before our supplies ran too low. During the past night the thermometer had fallen to −20°.0 C. or −4°.0 Fahr., and in the morning when we started it still stood at −18 C. or −0°.4 Fahr. But there was a beautiful sunrise, and the sky was clear. Yet ere the sun climbed very high above the horizon, the usual banks of clouds gathered and intercepted his rays, thus keeping the earth cold.

A cup of hot tea and off I set, to lead the way. After traversing a considerable number of crests, I at length reached the culminating point of the isthmus, where I stopped to survey the country ahead of me, and examine it through my glass. In the distance, in the direct line of our march, I perceived a bayir, which at once arrested my attention, because of its unusual appearance; it was covered with little black dots. Curious to know what they could mean, I hurried down and was still further astonished to discover kamish leaves lying on the slope, whither they had been blown by the wind, as well as traces of some small rodent no bigger than a rat. Upon getting lower down and nearer to the bayir (no. 30), I observed, to my delight, that there were reeds (kamish) in it, although dry and shrivelled, and growing in thin, scattered bunches. Besides this, I also discovered, a little later, live yellow kamish, which I had failed

Descending the Steep Face of a Sand-dune.

to observe at first owing to its being of the same colour as the high dunes which crossed the depression diagonally.

Gladdened by this unexpected sign of life, I waited till the caravan came up and joined me. The men could not have been more delighted had they seen paradise opening before them, and the camels distended their nostrils, sniffing pasture. We called a council of war. Turdu Bai proposed to stay where we were and let the animals have a good feed; they had grown tired of living upon nothing but maize, and during the last day or two had brought up what they ate. But on the supposition that the next bayir would be still more favourable, I sent on Islam Bai to reconnoitre, whilst the rest of us followed slowly after him, letting the camels browse as they tramped along. Our pioneer signalled to us to push on, and we did so, and encamped in bayir no. 31, although in point of fact it was not really much better than the former one.

This was a most unexpected and astonishing discovery—to come upon vegetation in the middle of the desert, 70 or 80 miles from the nearest water. It could not possibly be an extreme outlier of the vegetable-belt of the Tarim, for it was separated from that river by miles upon miles of the barrenest sand, and soil heavily impregnated with salt. Nor could it in any way owe its existence to the Cherchen-daria, for that river was still 90 miles distant. Perhaps the river Kara-muran may at one time or another have flowed in this direction. Anyway we all took fresh heart, and the immediate future presented itself in quite rosy colours.

We now gave each camel a couple of pailsful of water, or about 6½ gallons, the ice being melted over a fire of kamish stalks, and they swallowed it like a cup of tea. This made a big hole in our ice supply; but, on the other hand, it lightened the loads we had to carry.

At sunset we turned the camels loose to graze. Then, as long as the light lasted, we gathered heaps of dry kamish, and so were able to economise with our wood for at any rate that occasion.

The sun set that evening with an unusually fine display of colour effects. The heavy clouds, which all day long had obscured the sky, parted asunder and revealed their upper sides —greyish violet, edged with vivid gold—and their under sides, a dun yellow like the sand-dunes. It was as if the image of the desert were reflected on the mirror of the sky.

CHAPTER XVII.

IN THE HEART OF THE DESERT.

THE disagreeable weather still continued. During the night of the 27th December, the thermometer sank to −21°.0 C. or −5°.8 Fahr. When we awoke next morning the wind was blowing from the east, the country was shrouded in haze, and the sky heavy with clouds, through which not one single ray of sunshine succeeded in penetrating all day long. We had chanced into the land of everlasting twilight, so that the opportunities I enjoyed during the journey of using my photographic apparatus, or making astronomical observations, were extremely few. As I experienced the same sort of hazy weather when I was on the Keriya-daria in the winter of 1896, I suppose it must be characteristic of the interior of the Takla-makan Desert. In such a haze you are easily deceived as to distance. You imagine the bayir you are just entering will be a long one, because you are unable to see the farther end of it; but before you have advanced very far, the inclosing sand-dunes rise up like ghosts in your path. The promontories immediately in front of you loom through the "smoke" of the dust like far-off mountain-chains. In fact, you get so confused as to both distance and direction, that you do not know which way to go. The wind was so piercingly cold that riding was out of the question; it was much better to walk and lead the horse.

The arrangement of the sand still continued to be subject to the same laws, the desert being swept by a power which with sovereign energy had modelled into plastic forms the peculiar volatile material that filled it, viz., that something intermediate between land and water. The shape of each individual sand-dune was copied in the promontories, and repeated again in the countless ripples which crumpled its slopes. The deepest part

of the "hollow of the wave" was always close to the base of the steep sheltered side of the dune; and this was true also of the bayirs, the most developed form of the "hollow of the wave." The desert sand, after being originally ground out of the hard granite mountains, is compelled to obey the same laws as the highly unstable water. It breaks into waves, as does the heaving ocean, and like the ocean it keeps moving unceasingly onwards, only at a much slower pace.

In bayir no. 33 I was able to ride on a good distance ahead, and was led to do so by a certain black object I saw rising above the dead and withered kamish. This last was seldom more than eight or nine inches high, and had the appearance of having been grazed off. Yet that was not the case; the reeds had only begun to droop (and they would eventually die) after their roots failed to reach the ground water below. The black object which so greatly excited my curiosity turned out to be a tamarisk, the first we had seen for several days. It was still maintaining a precarious hold upon life; but round about lay its boughs and branches long since dead. These, however, made a welcome addition to our supply of fuel.

I rode on for yet another hour, without seeing the end of this friendly bayir, or of the kamish either. This last was still living, had even a tinge of green in it sometimes, especially close to the drift-sand; but it was quite dead on the level "dust-ground." It almost looked as if sand was necessary for its welfare or helped to preserve it alive. I saw no more tamarisks, and so, upon reaching a spot where the kamish was thicker, and furnished some protection from the wind, I dismounted, tethered my horse, and kindled a little fire.

It was quite dusk when the caravan came up. Here we lost our first camel, a magnificent male, the best of the fifteen which had tramped all the way from Kashgar. For the last four days he had been unwell, and therefore travelled slower than usual; indeed he had refused to eat anything, ever since we started from the Tana-bagladi-köll. Turdu Bai shed tears. He was extraordinarily fond of camels, and always found something to do for them long after the other men were resting beside the fire. This big fine fellow did not, however, die from weariness or want of food, like so many of his successors. The Mussulmans said, "Khoda kasseli värdi!" "God gave him an illness," and no doubt his death would have been just as inevitable had he been grazing on the Tarim

steppes instead of trudging with us through the desert. All the other nine camels were keeping wonderfully well, and yet it was the ninth day since we started. In my former journey across the Takla-makan it was precisely on the ninth day that I was forced to abandon my two men, four of the camels, and the whole of my baggage; but then we suffered terribly from both heat and thirst. Now, however, we were chilled to the bone, owing to the intense cold, and had an abundance of water.

We had now reached that stage in a desert journey at which the difficulties lay behind us, and our attention was mainly directed to the discovery and observation of fresh signs of life and the presence of water. Leaving behind us these the first kamish and tamarisk we had seen, we marched on in the same long bayir (no. 33), with the high steep wall of sand on our left. Every now and again a low tongue of sand projected from the right, but after each such headland the bayir opened out again, and pointed on and on like a dry river-bed carved between the lofty sand-dunes. The ground was patterned in every direction by the tracks of hares; and here also we observed the foot-prints of foxes. Shortly afterwards we came across a few steppe plants, clumps of grass, and *chiggeh*, a variety of rush very common in the Lop country. At length there appeared also more tamarisks, some of them fresh and elastic, others dead, and still resting on their characteristic root-mounds.

The going was all that could be desired, for the ground was level. Who would have supposed we should be so favoured in the heart of that vast desert? But it blew so hard from the east, that I was sometimes obliged to dismount and walk, to prevent my hands and feet from getting frozen. At last I reached the end of this very helpful bayir, and found it terminated in an exceptionally high isthmus of sand. As the ground just below it was the lowest level throughout the bayir, and seemed to indicate that the "ground water" was not very far down, I collected an armful of dry tamarisk branches, and made a fire, and then waited for the others to come up. Islam and Ördek at once set to work and dug a well, while Turdu Bai looked after the camels, and Kurban collected more fuel. We reached water at a depth of 4½ feet; it was almost perfectly fresh, and had a temperature of 8°.2 C. or 46°.8 Fahr., but trickled out desperately slowly. That evening we gave

two of the camels their full quantity, namely, half-a-dozen bucketsful, of water each.

Hence we were now amply provided with everything we needed—water, firewood, and grazing for the animals. It was a veritable oasis in the heart of the desert. We kept two big fires blazing all the evening, and their red glare played upon the tops of the dunes, from which the drift-sand came pouring over us like rain, as it was caught up by the wind. The men when following in my footsteps had come across yet another encouraging sign that we were getting into better regions, namely, a large black wolf, which fled over the sand-dunes westwards.

This day's rest was heartily welcome to both men and animals. The men had for the most part travelled on foot, the camels had borne heavy loads ; and we all suffered more than usual from the cold and the wind, because we had not sufficient firewood to warm ourselves with. We made our camp as comfortable as circumstances would allow by converting the white felt carpet, which was generally laid underneath my bed, into a make-shift tent, and propping it up with two or three tamarisk branches. This sheltered us against the storm, which raged all day, and also allowed me to have a big fire. The men protected themselves in a similar manner.

In the morning the water which had gathered in the bottom of our well was frozen, and the earth we had flung out of it as hard as a stone. Each camel drank not less than nine bucketsful, two of them even drank eleven ; you could actually see their skins swelling out as they gulped the fluid down. This wrought a remarkable change in their spirits. They grew quite lively, and began to jump about, and play, and afterwards ate away eagerly at the thin patches of kamish. Now curiously enough, whilst close to the ground, the storm blew from the east, higher up, in the sky, masses of black cloud were drifting from the west to the east. The last day of the eighteen hundreds—that is the last day of the year 1899—looked quite promising, even before it was fully light, for I noticed the stars beaming down upon our bivouac, while the tamarisk mounds stood out like black phantoms. However, when we were making ready for the start, the weather again came on as thick as ever. That winter was characterised by bright, still nights and windy, cloudy days, which made the earth all the colder.

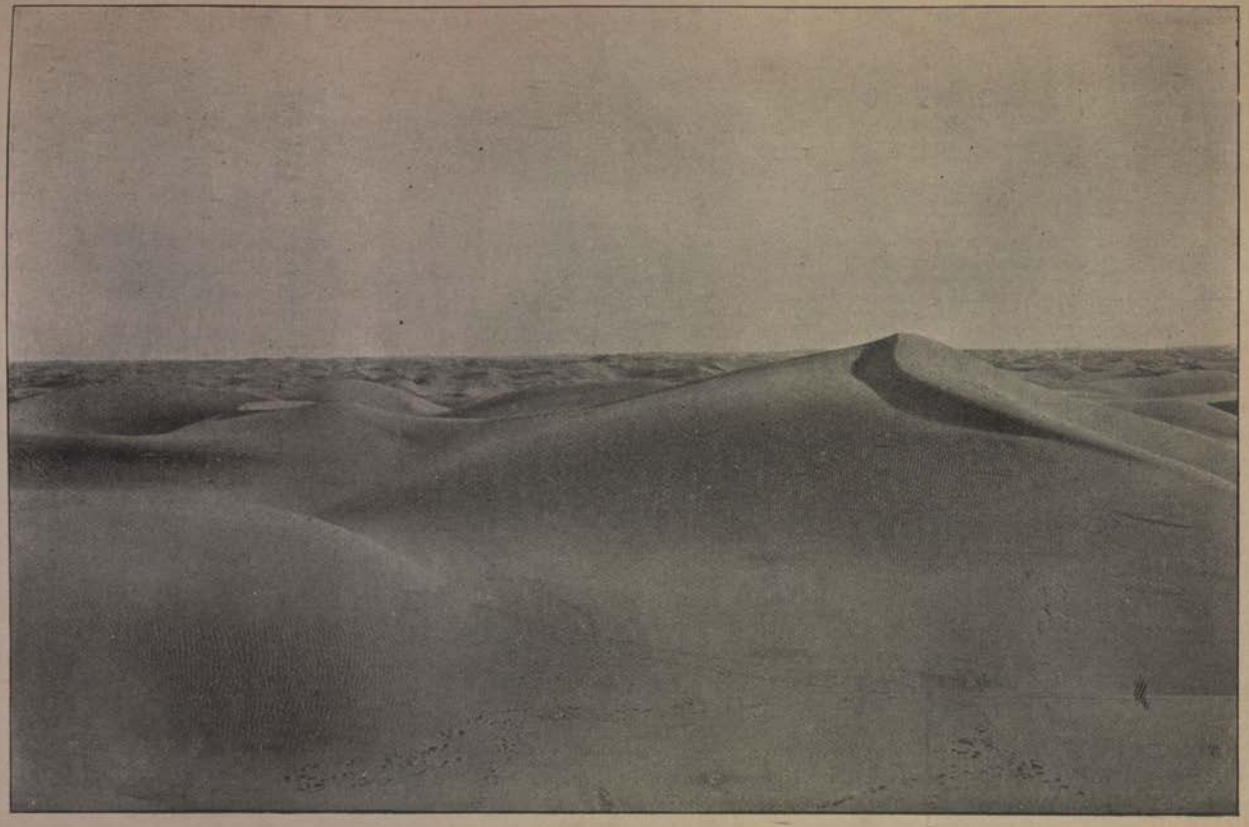
The caravan quite distinguished itself that day by doing 15

miles, the longest day's march during the whole of that desert journey. Although one of the camels had perished, their burdens were now so small that the men were allowed to ride in turns, especially as the ground was for the most part level and firm along the bottoms of the successive bayirs.

There was still vegetation in bayirs nos. 34, 35 and 36, but the tamarisks were less frequent. From the neck of sand which bordered the southern end of the last of these depressions, a bayir extended towards the south-east, but as it did not coincide with the direction in which we wanted to go, we left it on the left hand. I saw the men considered it a mistake not to follow it, instead of striking off as we did for a high pass to the south-south-west. Nevertheless, I was as much surprised as they were, when we reached the top of the pass or isthmus and looked down into bayir no. 37, for it was broad and open like a field, quite different from the inclosed areas which its predecessors were. The pass that bounded it on the south resembled a very low " threshold " or cross-ridge, and beyond it we were unable to perceive any sand, a fact I attributed to the great distance and the thickness of the atmosphere.

Bayir no. 38 was equally extensive, and just as open as no. 37. It seemed as if some invisible hand had ploughed a gigantic furrow through the desert on purpose to serve as a track for our caravan. We encamped near its beginning, at a spot where there was plenty of good fuel. Islam wanted to use up our last camel-load of wood; but Turdu Bai, like a prudent general, proposed to take it just one day longer—a very wise suggestion.

Here we were then, that still and quiet New Year's Eve, encamped around two fires, under the open sky, and in a locality that was as peaceful as any forgotten grave beside an unused track in the heart of Asia. Our friends did not know where we were. The people we had left behind at Tura-sallgan-uy were no doubt uneasy about us, especially since their imaginations had been excited by Islam's sensational descriptions of our former journey across the desert in 1896, now no doubt enhanced by the account which Parpi Bai would be able to give them of the first three or four days' march of this present journey. The Cossacks saw for themselves what sort of a country lay before us in the reconnaissances they took part in, and afterwards admitted they were afraid we should find every road barred by the sand, and should perish of thirst, weariness, and cold.



The Interminable Desert "Ocean."

My four companions admitted also that until that afternoon, when for the first time we came within reasonable sight of a happy termination of the journey, they had been filled with anxiety. They could not, however, understand how I was able to determine with such accuracy the distance to Tatran. I suppose they thought my promises and assurances were simply so many well-meant attempts to allay their fears.

If the first day in the new year, to say nothing of the new century, could in any way be taken as an augury or prognostication of the future, then in all conscience the 1st of January, 1900, was as full of gloomy forebodings as it well could be. The sky was hung with a black shroud, and there was not a single glimpse of the red promises of morning. At seven o'clock the temperature stood at −15°.0 C. or 5°.0 Fahr., and when I arose and dressed, it was, thanks to the big fire, even warmer still. The only circumstance which in any degree inspired us with New Year's feelings was, that bayir no. 38 seemed to extend to a vast distance, and we started with buoyant steps. The men even fed themselves with the foolish hope that this was the beginning of the steppes which stretched down to the bank of the Cherchen-daria. Vegetation still continued scanty—an occasional clump of grass, a few stalks of kamish, or a tamarisk. In the sandy soil were a number of small holes belonging to a species of rat, which the natives called *säghisghan*.

Upon reaching the isthmus which closed this bayir on the south, we started to cross it at its lowest part, thinking it was quite narrow; but in this we deceived ourselves, for it was the broadest we had yet encountered, and continued to increase in height as we advanced, until at last it merged gradually into a labyrinth of big sand-dunes.

Ascending to the highest point in the vicinity, we searched in vain for the next bayir; but this peculiar formation appeared to have now come to an end. As far as our gaze was able to penetrate southwards, the desert ocean predominated in every quarter, the lofty walls of sand which had hitherto been on our left hand likewise came to an end, and there were no longer any depressions—in a word, the architecture of the desert had all at once changed, though fortunately for us the dunes still continued to run north and south.

Up to this point we had made admirable progress, we had been like ships threading the sea-weed and drift-ice in smooth water; now we passed out into the open sea again. The waves

of our "sea" were as high as houses, and we crawled along at a desperately slow pace, up and down, up and down, over the heavy dunes, first one camel stumbling and falling, and then another, and every time one did so, we had to unload the animal, get him up on his feet again, and reload him. Vegetation had now almost entirely ceased. I once more began to suspect that the oasis we had just crossed belonged to an extreme outlying bed of the Kara-muran. If that was the case, we might make up our minds to some exceedingly difficult country before we came in touch with the Cherchen-daria.

Eastwards in the far distance there appeared what looked like a continuation of the depressions, but they did not run in the direction in which we wanted to travel. Towards the south the elevations seemed to have been levelled down, with the exception of an occasional dominating dune with a sharp crest. In other words, the horizon line resembled a saw-blade with a notched edge. Occasionally a dead tamarisk came into view, perched on the top of its root-mound, amongst the sand-dunes, but the distances between them grew greater and greater. Hence, upon reaching a living tamarisk, with a litter of dead branches and some kamish about its feet, we halted, after a toilsome march of only 8½ miles.

Upon awakening at daybreak, on the morning of the 2nd January, I found we were enveloped on all sides by a perfect winter scene. It was snowing softly, the ground was perfectly white, and the dunes were indistinguishable from stupendous snow-drifts, every vestige of sand being smothered out of sight. Islam had thoughtfully spread a cloth over my box, for as usual I left my instruments and note-books lying on its lid the night before. It was still only half-light when the fire was kindled in front of my bed, and the falling snow glistened and sparkled like diamonds against the background of its flames. For it was descending, not in the usual form of soft flakes, but in delicate crystals, as though it were rime-frost. During the first few hours of that day's march the landscape was blindingly white in every direction. This was the first time I had ever seen the sand-dunes of the desert in this unusual attire, this funereal winding-sheet, and its effect was to enhance still more their corpse-like nakedness and desolation. But as the morning wore on, the slopes looking towards the south threw off the thin covering of snow, and shortly after noon the declivities on the other side also resumed their usual yellow

tones, until finally all that remained of the snow was a tiny strip in the bottoms of the hollows.

The sand continued to grow more and more difficult, and no bayir appeared to ease our plodding footsteps; it was sand, sand everywhere. The steep sheltered sides of the sand-dunes looked now towards the south as well as towards the west, pointing to the fact of there being two systems of dunes intercrossing one another and so forming a network, the meshes of which were long ago sanded up. It was evident the winds were less regular here than in the northern half of the desert. It was a good thing we did not start from the south; we should never have got through, but should have been compelled to turn back, for no fires, however large, would have been able to pierce far through the haze with which, during that winter, the atmosphere was intermingled.

At four o'clock in the afternoon it began to snow, and this time the snow came down thick and fast. We were evidently not doomed to perish for want of water. It was a regular snow-storm, driven before a south-south-west gale. What a difference from the sand-storms of the Takla-makan! In half-an-hour the country was like a white sheet: the clouds were trailing their snowy draperies so low down as actually to touch the ground. Then down came the twilight, engulfing the chaos of sand and snow, and we began to look about for a spot where we could tie the camels for the night. At length we observed, about one mile ahead of us, a black point, and for it we resolved to make, let the cost be what it might. Nevertheless, it took us a good hour to get there, and was pitch dark when we arrived. The black object proved to be a tamarisk, and beside it we found some fuel.

The falling snow did not sizzle against the flames of our fire, it was converted into steam before ever it reached them; but it left more perceptible traces on my note-book. By this, the ordinary oases had entirely ceased, and wherever the eye turned there was nothing but sand, barren sand, yellow sand. For a couple of hours or so we followed the tracks of two foxes, an older one going north, and a fresher one, showing that the creature had returned to the Cherchen-daria. What was he looking for in the desert? Surely he could find a more fruitful field for his predatory instincts nearer the river.

Ördek felt ill at ease in this weird ocean of desolation;

it seemed to him to be without boundaries, without termination; the sun never shone there; and with each succeeding day we apparently got deeper and deeper entangled in the hopeless labyrinth of sand-dunes. And he began to talk with ecstasy of the banks of the Tarim, of its lakes, its canoes, and its fishing-grounds as of a paradise to which he would never return. He talked of the swans, those celestial and sensitive birds, which haunt the lakes of his native land.

The camels were now beginning to show the effects of the journey, and we felt it was necessary to give them a day's rest. We again dug for water, and found it at a depth of $3\frac{3}{4}$ feet; it had a faintly bitter flavour. Besides this, we had of course the snow. The ground was frozen to the depth of 13 inches. It snowed all day long, in thick blinding flakes, which hissed and sizzled when they fell upon the fire. The men made little exploring trips in the vicinity, and in the evening Turdu Bai came back with two big camel-loads of firewood, which he had gathered close by. I was almost dead-beat with weariness, and lay and read all day long in the midst of the snow-storm, the flakes dropping upon the paper I held in my hand, so that I had to keep shaking it, to prevent them from covering the words I actually wanted to read. Even at mid-day it was only half-light, so that in the murky atmosphere, sand-dunes, earth, and sky all melted together into one confused blend of whirling whiteness. It was still snowing last thing at night, when the sparks from the fire leapt up as if to encounter the snow-flakes, and turned them into water-drops, which flashed on the night like sprays of glowing iron.

Considering that the thermometer fell to $-30°.1$ C. $-$or $22°.2$ Fahr. during the night, it was a bit cool for sleeping out in the open air; while at seven in the morning it was still $-27°.0$ C. or $-16°.6$ Fahr., and when I got up at half-past eight, no less than $-24°$ C. or $-11°.2$ Fahr. Decidedly cold that for a dressing-room, for I always made it a practice to take off my clothes and sleep in night-attire. The worst part about it was washing and dressing with a temperature of $30°.0$ C. or $86°.0$ Fahr. on the fire side of you, and a temperature of $-30°.0$ C. or $-22°.0$ Fahr. on the other side of you. It continued snowing every bit as heavily all night, and in the morning, when I awoke, I was completely covered up, so that Islam had to fetch a spade and kamish broom to get me out. But the snow had helped to retain the heat inside my nest, so that I did not feel the cold.

However, I was more comfortable after I had struggled into my clothes and sat drinking my tea beside the fire, with a warm fur coat about my shoulders.

It was still snowing, and snowed on and on all day. The thermometer never rose above −13° C. or 8°.6 Fahr., which is far from pleasant when the wind blows straight into your face with a keen cutting edge to it. As some compensation for this, the ground was not altogether unfavourable. We were frequently able to make detours round the worst sand-dunes; and before the day was over we once more came into a string of small bayirs, which ran south-south-east and were filled with sand. In one of these, no. 43, we encamped for the night, although there was not a scrap of fuel of any description; but we still carried with us half a camel-load of our original supply, and let the consequences be what they might, we *must* have a fire that night, for we were all literally stiff with cold. The snow was unable to remain long on the slopes and declivities which faced south, because of the rapidity with which it evaporated. But it clung to those which faced north, and lay some inches thick in the bottoms of the depressions. Hence, upon looking northwards, the country was almost everywhere an expanse of bare sand, but upon looking south, nothing but snow.

At last, then, the black clouds, which had overhung the desert ever since we started, had been induced to part with their contents. All night long between the 4th and the 5th of January the snow went on falling, falling as softly as wool, and in the morning even the places where the fires had been were buried under snow. Everything we wanted, every single thing we possessed in fact, had to be fished out from underneath this soft white coverlet. The camels also were snowed up, and truly picturesque they looked in their be-powdered "wigs," like great lords of the Gustavian (or Georgian) period, with little snow-wreaths at their backs, and tiny icicles in their peaked beards and round their mouths. At nine o'clock it cleared up a little, although the fine snow needles still continued to flash their brightly glinting facets in the sunshine. However, it was nothing more than a temporary lull, for at the end of a couple of hours or so it began to snow again. When the camels moved, the snow crunched with quite a wintry sound under their feet.

By this every speck of sand had once more vanished from

sight. During the morning the steep slopes, which were turned towards the west, lay in the shade, and presented a magnificent spectacle, with their several nuances of steel-blue, the shades varying with the steepness, while above them glittered the white domes of the sand-dunes brilliantly lighted by the rays of the sun.

The high sandy promontories bore a striking resemblance to the crest of a mountain-chain clothed with perpetual snow. I fancied I had before me a reproduction in miniature of the Trans-Alai, with Peak Kaufmann: the pale blue colouring was precisely the same. The extent and brightness of the snow were very trying to the eyes, although I wore double snow-spectacles, and every one of the men had smoked glasses. Yet the atmosphere was nothing like so clear as it is in the mountains on bright days. It was too full of snow crystals to admit of our distinguishing contours and shapes at more than half-a-mile away. Beyond that everything was mantled by the opaque blurr of the falling snow. And so far it was an advantage, for the ground immediately in front of us was not very favourable—mountains of sand growing continually higher, not a patch of native soil as big as a square yard in area, no vegetation living or dead.

During the course of the day the snow showed certain variations. Notwithstanding the rate at which it melted and evaporated, it grew deeper the further we advanced towards the south, this being a natural consequence of our nearer approximation to the mountains. Sometimes there was a crust upon the snow, so hard that it would have been possible to skate upon it for long stretches together. Who would have believed that such a thing could be possible in the desert?

Generally speaking, the snow facilitated our march, for by keeping along the lines of contact between snow and sand, we were able to take advantage of the effects of regelation, which were strongest marked there. The crests of the dunes in particular were as hard as ice, and a single step on the steeper slopes sufficed to set a patch of twenty to twenty-five square yards slipping bodily down the declivity. The snow had the same effect upon the sand that oil has upon waves; it would have been impossible for even the fiercest *buran* (black desert tempest) that ever blew to have shifted it with that snow lying upon it.

On the 6th of January the desert ocean still presented the

same features, though, if anything, its "waves" ran somewhat higher. On the whole the ground rose a little towards the south; at any rate we had a far wider outlook in the opposite direction. The camping ground we chose that night was the worst we had hitherto had, namely, a mere hole in the sand, in a spot where there was not one single blade or leaf of vegetation to be seen anywhere. The temperature of my bed was nearly −20°.0 C. or −4°.0 Fahr. when I crept into it, and I had to wait patiently for some little time for my limbs to thaw and the blood to circulate before I found energy enough to stop up all the holes and crevices through which the cold night air penetrated. It was difficult to sleep that night on account of the cold and the wind, and in the morning we had nothing with which to combat these evils, except a handful of chips, and even then the thermometer registered over 43 degrees of frost (−24° C.) The men tried to keep themselves warm by lying in a lump all together. They were fast losing heart in this dim, weird country; we were like ship-worms penetrating into a sandy plank of the hull of Mother Earth.

It was ten o'clock the following morning before we were sufficiently thawed to continue our tramp across these strange hills of intermingled sand and snow. The atmosphere was, however, remarkably clear, and here we obtained our first glimpse of the outermost chain of the great Kwen-lun system, namely, the range of Tokkuz-davan. To the north the sky was pure and blue; but to the south it was streaked with low white clouds, very often scarce distinguishable from the tops of the snow-covered sand-dunes, so that the latter had the appearance of merging into level snow-fields which led directly up into the sky.

Meanwhile, from the top of a neighbouring sand-dune, I made a welcome discovery. Whilst examining the horizon with my field-glass, I caught sight, away towards the south-east, of something which looked like black stumps projecting through the snow; that could mean only one thing—a dead forest. Although the place where I saw it lay a little off our line of march, I ordered the men to make for it, and that night we encamped amid a grove of dead and withered poplars.

The men set to work with quickened energy and fresh courage. Shovelling away the snow, they began to ply their axes, and very soon had several piles of wood ready for kindling.

One huge poplar close to the camp was too big to be felled, so we set fire to it as it stood, and let it burn—a gigantic torch lighting up the white pall of the desert. Another poplar, with a hollow trunk, was flung across my fire, and the flames roared through it, as though it had been a funnel. It glowed, it crackled. The flames lit up the interior, making it gleam like rubies, until the bark burst, and curled and withered under the fierce advance of the devouring element. Gigantic columns of smoke soared up as if to greet the moon, which now for the first time for many days emerged from behind the screen of clouds. That night my men outwitted the cold. They dug holes in the sand, filled them with hot ashes, shovelled the sand back again, and slept on the top of it. For the last two or three days the camels had had nothing to eat, and there had been nothing to give the dogs except bread. On the other hand, we had no lack of water, for the ground was everywhere covered with snow to the depth of eight or a dozen inches.

The next day, the 8th of January, liberated us from the ban of that ghastly desert. Before we started, I comforted my men with the promise that they should sleep that night on the bank of the Cherchen-daria. We did not trouble to carry firewood with us, for we perceived other dead trees some distance ahead. Yet as we advanced, these grew fewer; however, before we lost sight of them altogether, we collected enough wood to make a camel-load. Upon reaching the top of a dominating sand-dune, I noted, towards the south-east, the first indication that we were approaching our goal, namely, a dark line on the horizon, contrasting very sharply against the universal sheet of snow. It could only be the belt of forest which bordered the Cherchen-daria.

An hour's march brought us to the first tamarisk cones. The dividing line between the desert and the forest was extremely abrupt. Not a bush marked the transition; the last slope of the sand-dunes swept straight down to the foot of the trees. The tamarisks stood so close together, that we had some difficulty in threading the narrow, winding avenues which formed the only pathways through them.

The men wanted to stop in a grove of mature poplars, where there was a superfluity of everything we wanted; but I assured them, that if only they would have patience a little longer, we should be able to encamp on the river bank itself. Another

quarter of an hour brought us to the road which leads from Cherchen to the Lop country, where new-made tracks of cattle and sheep were visible in the snow. Following that road a short distance, we came to the river-bank, and there pitched our camp on a little hill overlooking the stream, which was here some 350 feet wide and covered with ice. It was quite a pleasure to rest at the foot of these big trees and enjoy the beautiful view. The mountains stood out sharp and clear, and the snow sparkled in the moonshine. But the best sight of all was to see our six camels and one horse revelling amongst the reed-beds; and well had they deserved their feast. My men were amazed that I was able to calculate the distance almost to a *gulatsh* (fathom), and declared that they would now, without a moment's hesitation, follow me wherever I chose to lead them.

According to my former map (see *Petermanns Mitteilungen*, Ergänzungsheft No. 131) the distance between the point where we struck the Cherchen-daria and the point where we left the Tarim at Tana-bagladi-köll was 177 miles. According to the measurements which I made during the march just concluded, it amounted to 176½ miles; which is as great a degree of accuracy as can be expected over such ground.

I had thus succeeded in crossing the broad Desert of Cherchen, at the cost of only one camel, and without putting an undue strain upon the others, which were all in good condition. The highest sand we encountered was in the north, but the most difficult in the south, owing to the fact that we were unable to get round the dunes. The happy issue of the expedition was due to the unexpected occurrence of the bayirs, which carried us over two-thirds of the distance, and to the circumstance that we hit upon water, fuel, and fodder (kamish) in the middle of the desert. What led me to attempt this long and dangerous expedition through the desert was, that an older edition of the map of the Russian General Staff, dealing with the region south of the Siberian frontier, showed a road crossing this desert from Tatran to a point a little to the west of Karaul. I considered that it would not be marked on the map unless there existed some warrant for it, and I am now of opinion that it is not impossible some such road may have run in that direction in former times.

The camels well deserved "a day off" amongst this luxuriant pasture, and it suited excellently, for I wanted to

take an astronomical observation, which would occupy me a whole day. As the temperature did not rise higher than −14°.0 C. or 6°.8 Fahr., while there was at the same time a slight breeze from the north, I was unable to use the theodolite without warming my hands at the fire after each observation. In the evening, when I took an observation of Sirius, the thermometer was down to −25°.1 C. or −13°.2 Fahr. and the tips of my fingers stuck to the instrument, which felt burning hot.

Ördek went out to reconnoitre, and managed to light upon a shepherd dressed from the crown of his head to the sole of his foot in sheepskins. He was greatly taken aback at finding visitors such as we intruding upon the peaceful solitude of his woods. But we soon became good friends with him. Not only did he sell us a sheep, which made a welcome variety in our bill of fare, but when he returned in the evening, he brought us a can of milk. The heavy snowfall of the last few days had been disastrous to the 400 sheep which he and two companions were in charge of. Several of them had frozen to death, and the rest had had great difficulty in getting at their food. The name he gave to that part of the forest was Kenglaika, or the "Broad Inundated Tract." The river had been frozen for 20 days, and would remain frozen another two and a-half months. Thus the Cherchen-daria freezes considerably later than the Tarim; but then it has a steeper fall and lies on a more southerly latitude.

We were only four miles from Tatran. According to my survey, I expected we were a good day's journey distant. The discrepancy was due to the variation of the compass, which amounts in those regions to 6°. In other words, if you steer your course direct south by the compass, you will in point of actual fact travel 6° west of south.

During the 10th and 11th of January we travelled on to Cherchen by the road which I had already traversed on the occasion of my former visit. About one month previously, a new beg had been appointed to Cherchen, and, to my delight, I learned that he was no other than Mollah Toktamet Beg, that is my old friend Togda Mohammed Beg, from Kopa. Accordingly I directed my steps towards his house, and received a hearty welcome. With his seventy-two years, he was the same pleasant old man, aristocratic looking, and polite, that I had known him before, and he placed his house at my disposal. I therefore took up my quarters in an inner apart-

ment, while my men were accommodated in an outer one. This was the first occasion, and one of the very few occasions, on which, during the whole of this journey through the heart of Asia, I slept under a house-roof.

At Cherchen, which had grown into a place of about 500 families, we rested from the 12th to the 15th of January.

CHAPTER XVIII.

A TWO HUNDRED MILES RIDE IN FIFTY DEGREES OF FROST.

TALES about towns and treasure said to be buried in the desert were incessantly being repeated to me, more especially a tradition about an ancient city supposed to lie near Andereh-terem, 100 miles west of Cherchen. But although I questioned the natives exhaustively, I was unable to obtain any definite or trustworthy information about it. They were afraid I should go to the place and discover all the gold which their wild imaginations depicted as lying hidden underneath the sand-dunes. It was, however, part of their tradition that the ancient town in question was haunted by ghosts, and—what is certainly strange—that it was a city which travelled. One man told me he had actually been to Andereh-terem, and seen a cylindrical tower of blue pottery, ten fathoms high, but it looked so strange and mysterious that he had not dared to approach it. Afterwards, having recovered his courage, he went back firmly resolved to look for the gold that was inside it; but when he arrived at the place, behold! the tower had disappeared. He could not, therefore, undertake to guide me to the spot, for he was convinced, that the tower shifted about over the desert, and would only mock all our endeavours to find it.

Now, as it happened, the region between Cherchen and Andereh was one of the few districts of East Turkestan which I had not hitherto visited. Hence, I resolved to make a trip to the latter place, although it meant a forced ride of over 200 miles there and back. In addition to the guide whom the beg compelled to go with me, I took three other men, namely, Ördek, Kurban, and Mollah Shah, the last-named an inhabitant of Cherchen, who accompanied Littledale in his journey through Tibet. I bought three new horses, and hired another three to carry our belongings. Islam Bai and Turdu Bai I left behind

to look after the camels and my little white horse, and the dog, Dovlet II. The other dog, Yolldash, I took with me.

But before I quitted Cherchen I was destined to have a great pleasure. On the morning of the 13th one of Consul Petrovsky's jighits arrived from Kashgar, namely, Musa, the man who acted as my interpreter of Chinese at Khotan in 1896. He brought with him a well-filled post-bag, and I need not say I spent some right pleasant hours in devouring the contents of the letters and newspapers which it contained. How the man managed to find me so readily is to this very day a puzzle to me ; for it had been agreed between myself and Consul

On the Astin-yoll to Niya.

Petrovsky that the couriers were to travel to the Lop country *viâ* Aksu—that is, to the north of the great desert ; but Musa declared that he "knew it in himself" that I should be to the south of it. Islam Bai let drop hints about Musa having a sweetheart in Keriya, and it was the desire to see her which brought him that way round. If it was so, I give the girl my unadulterated blessing. Had Musa arrived two days earlier, I should not have got my letters until I returned to Tura-sallgan-uy, near Yanghiköll, for neither the beg nor anybody else in Cherchen had the least idea that we were likely to emerge from the desert, and so Musa would have continued his ride to the east.

We began our little trip of over 200 miles on the morning

of the 16th January, having altogether seven horses, all of them small but active, and perfectly fresh. Two of them carried our belongings, and provisions sufficient to last 12 days. So off we set at a gentle trot along the *astin-yoll* or "lower road" to Niya, a route that had been traversed in 1889 by Captain Roborovsky, a member of General Pievtsoff's expedition. This, however, was practically the only time during the whole of these three years that I did not actually break fresh ground; on all other occasions I was the first European to traverse the routes which I selected.

We soon left behind us the last dwellings of Cherchen, and struck into the barren country to the west, travelling between clay terraces, which had been moulded by the erosive force of the wind, with a belt of sand on our left, and tamarisks, occasionally also poplars, on our right. We halted the first night at the well of Kallassteh or the "Hung-up Skull," though the well itself was frozen. When I was roused in the morning, there were 40 degrees of frost (−22° C.), and the sun and moon both stood at the same altitude above the horizon, namely, about 5°, and both had precisely the same reddish-yellow colour. Any one ignorant of the points of the compass would at the first glance have been in doubt as to which was the luminary of the day and which the queen of the night.

Up in the saddle and off again! A wretched west wind sprang up and chilled us to the bone. I assure you it is no light thing to ride against the wind, with 36° of frost (−20° C.) in the air. Your hands get so stiff and numb with cold that the only way to hold the pen at all is to grasp it as you do a hammer. It is not exactly encouraging to start in the morning with the prospect of a day like that before you. You can't keep in the saddle longer than half an hour at a time, but have to get off, and stamp and run, to prevent your extremities from getting frozen. The people of Cherchen told me they never remembered such a bitter winter, nor yet so much snow.

The route was perfectly straight, except when it crossed the tongues of sand from the desert, and there it curved to avoid the sand-dunes, which turned their steeper sides to the south-west.

When we reached the well of Kettmeh, we were all so done up that we stopped for a quarter of an hour, and made a little fire to warm ourselves at. Then on we went again at a smart pace over gently undulating ground to Yantak-kuduk, where

we had to stop again for an hour to thaw ourselves. The same thing happened again at the well of Ak-bai. As a rule, all these wells were frozen hard into one solid mass to a depth of five feet. We met a small caravan of Tatars and *ishans* (holy-men) travelling from Keriya to Urumchi and a merchant with twenty asses, carrying *chapans* (cloaks), cloth, and 'kerchiefs to the bazaar of Cherchen. During the last part of the day's journey it snowed, and we began to look out anxiously for a place where there was plenty of fuel.

When we awoke the next morning, we were all snowed up. The new fall lay as light and soft as down upon the old and

Shepherds' Huts at Shudang.

now hardened snow-fall. The country was terribly monotonous and dreary. Not a hare, not a raven to be seen, nothing but the tracks of the former and of some wolves. Immediately beyond the well of Osman Bai-kuduk, the sand became plenteous, and then followed a labyrinth of tamarisk cones, amid which the track twisted and twined as if it were playing at hide-and-seek. These cones or pyramidal accumulations of roots, on the top of which the tree stands, were like curled-up hedgehogs or porcupines, some of them like huge shaggy heads sticking up out of the ground.

The bed of the Kara-muran was now empty and dry; there was not even a single patch of ice in it. It was 250 to 350 feet

wide, 3 to 6 feet deep, and was reported to bring down into the desert very considerable quantities of water, derived from the rainfall in the mountains to the south. The soil was yellow clay, deposited horizontally, and in layers of varying hardness, shaped into cornices, cubes, and terraces.

We encamped at dusk at Tokktekk, where there was a thick and luxuriant poplar wood, and did so because we observed fresh signs of the presence of shepherds. The only person we had met during the whole day's march was a solitary individual, a poor wretch, travelling on foot to Keriya, followed by a dog. The latter limped pitifully, was covered with blood, and had quite lost one ear, while the other hung by a small fragment of skin only. The man told us his dog had had a brush with some wolves during the night, and had got rather badly mauled. It must be a queer piece of work to travel from Cherchen to Keriya on foot, alone, and unarmed, in the depth of winter. But the man said, quite composedly, that at night he made a fire with flint and tinder, and the wolves did not come anywhere near him, whilst during the day they generally kept at a respectful distance.

During the night of the 18th January we had 50½° of frost (−28° C.), and next day travelled by short stages, making fires at frequent intervals. The region we had now reached was more plentifully watered by the streams which come down off the northern slopes of the Kwen-lun mountains, and consequently richer in vegetation. All the same, we had unbroken sterile sand on our left, though to the right there were steppe-land and small groves of wood.

Upon reaching Pakka-kuduk we heard shouts proceeding from the north, and Mollah Shah soon found they came from a friendly brown-bearded shepherd, who led us to the airy hut in which the bai, his master, lived with his family. The man only dwelt there during the winter; in summer his home was at Andereh-terem, for at the latter season the whole of this region is fearfully hot, and swarms with gnats and mosquitos. The wolves cause the sheep-owners great losses, especially when they get so numerous that the dogs are unable to cope with them. The shepherds say, that if a wolf only just touches a sheep, the animal will die of fright; and once wolves set upon a flock they will destroy it to the last sheep, unless interrupted.

At the well of Shudang we encountered another shepherd, watering ten or a dozen asses. The well, which was situated

in a depression, was 10 feet deep and yielded perfectly fresh water. Beside it stood a *lengher* or "caravanserai," built four years previously by the Chinese. Beyond Shudang the road led up on to a terrace, dotted over with tall and finely grown tograk woods. Here we pitched our quarters in the clay huts of the Shudang shepherds, and were warm and comfortable, especially after we killed two sheep, which the bai sold us in the evening. Here also we overtook another traveller from Cherchen, namely, a Chinese *siah* or "secretary," who was on the way to Keriya to report to the amban concerning his district. Like ourselves he stayed there a day to rest, and so we exchanged

Shudang.

visits. But on the following morning, when we set out, he had a fearful headache, brought on by over-indulgence in opium-smoking.

As I have stated in my former book (*Through Asia*), the river Mölldya or Möllja, at the point where it was crossed by the upper road, was a large river; but here on the lower road or *astin-yoll*, along which we were now travelling, it was hardly perceptible, owing to the fact that it was divided into a number of capricious arms, like an interlacing delta. This, of course, made irrigation more effective, and consequently the vegetation more luxuriant. The Kara-muran seemed, however, to be the bigger stream of the two, and no doubt it penetrates further

into the desert, or did do so at one time, for it was pretty certainly this river which may possibly have given rise to the scanty vegetation which we noticed struggling for existence in the bayirs we had recently crossed.

The shepherds, who lead such lonely and monotonous lives in these terribly remote regions, far off the beaten tracks of the world, are a good-natured, friendly people. At first they are naturally shy of strangers, but so soon as they are convinced that the latter mean them no ill, they become at once accessible. They all speak in soft, gentle tones, not at all unpleasant to the ear, and give the impression of seldom mixing with their kind, and of being almost afraid of themselves. Our shepherd had a really beautiful voice, with a great many variations in it, and he used it cautiously, speaking in subdued tones, almost as if he were afraid to speak at all. Had you merely heard his voice, without seeing him, you would have believed you were listening to a man of a much greater degree of culture than he actually possessed, for his appearance stamped him at once as an undeniable barbarian. He was clothed in sheepskins, wore a woolly cap, and his foot-covering was also made out of sheep's wool and sheep-skin. He was as black as an Indian, owing to his never washing himself; and his eyes were narrow and oblique, his nose dumpy and shapeless, his lips fleshy, and he was destitute of beard. All the same he did profess some sort of religious faith, for as we rode past a *masar* (saint's grave), he recited a Mohammedan *dua* or "prayer," and drew the palm of his hand along his face, as the Mussulmans always do when they repeat their *Allahu ekbar*.

On the morning of the 22nd January we were again snowed up, the snow lying a foot deep. At this point we quitted the main road and struck across the trackless country straight for the "ancient city." A snowstorm was raging, and the going was bad, for the track led through a chaos of small disconnected sand-dunes, intermingled with tamarisk cones, the whole blurred by the fresh-fallen snow. At each step the horses sank in over the fetlocks. All this made it really hard work to get along, so that our progress was fearfully slow. At length we came to the ruins of a house, containing two square rooms. The walls consisted of clay, upheld by a skeleton framework of posts and spars, and were still standing to the height of 19 feet. They were extraordinarily thick and strong, and suggested that the structure must anciently have been a fortress. We encamped

a short distance away, near the ruins of some very ancient towers. The snow still continued to fall, and was so deep as to render the examination of the ruins a matter of extreme difficulty.

In the evening, after the camp was ready, Turduk, our Cherchen guide, used to prepare his pipe. This was a highly original contrivance. Cutting two chips of wood, he used to stick them both together into the ground, one perpendicular, the other sloping towards it at an angle of 45°. Then he packed moist clay all round them, and drew out the chips of wood, and his pipe was ready. The vertical opening, or bowl, was filled with a pinch of the horribly sour tobacco grown in the country, and the sloping opening served as the pipe-stem. But the attitude which the man assumed when he smoked this primitive implement of luxury was neither very comfortable nor very elegant; for he was obliged to lie at full length on his stomach on the ground.

During the course of the evening the snowstorm increased so greatly in violence, that, having no tent, we deemed it necessary to take some sort of precautions for our own safety. My bed was prepared in the usual way, by shovelling the snow away and laying it on the bare ground, with the higher end next my little instrument-box. To this last, a felt was fastened, and stretched out so as to cover at any rate my head, and then propped up at its other end by a couple of tamarisk branches; my feet and lower extremities, however, became gradually buried under the falling snow. During the night I was awakened by feeling something like an icy cold hand touching my face. It was the felt, which, weighed down by the snow, had fallen in, and some of the snow had found its way along my neck into the bed. The snow melted close round the fire and made the felts sopping, as though they had been dipped in liquid mud, and in the morning we made a queer spectacle, and had no little difficulty in getting our clothes dry.

After that we went and examined the *kona-shahr* or "ancient town." It consisted of a remarkable massive wall, and several mounds and barrows. We also detected traces of a canal, which had clearly been connected with the adjacent stream of Bostan-tograk. The best preserved relic was a tower, 34½ feet high and 79½ feet in circumference, with an opening or port-hole high up on one side, inaccessible without a ladder, for the interior of the tower was solid. There were two other towers

a little to the south-east, all three being in a line, probably alongside an ancient highway. Beside them we discovered a large quantity of red and black potsherds of burnt earthenware, but no traces of inscriptions or ornamentation. The whole were sadly battered and weathered; but unfortunately the depth of the snow prevented a closer and more exhaustive examination.*

In the evening we continued our journey towards the Bostan-tograk, the high, steep banks of which were lined with thin belts of poplars and reeds. The river had scooped out for itself a trench 26¼ feet deep and 463 feet broad, and at Andereh had a volume of 106 cubic feet in the second.

At Andereh and Baba-köll, which formed the end of our journey, we turned about and went back to Cherchen. On the way we met nobody except a caravan of asses, bringing down from Northern Tibet to Keriya a collection of wild yaks' and wild asses' skins. It was a bitterly cold ride we had. During the night of the 24th January the thermometer sank to − 29°.6 C. or − 21°.1 Fahr., equivalent to 53 degrees of frost, and the highest point it reached was only − 14° C. or 6°.8 Fahr. Exposed to these intense degrees of cold, especially when accompanied by wind, you lapse into a state of apathy. As, however, we were returning by the same road we had gone out, there was no need for me to plot the route or take any measurements, and so I kept my hands wrapped inside the sleeves of my Sart wolfskin fur-coat.

During the night of the 26th we had 56° of frost (− 31°.2 C. or − 24°.2 Fahr.), and when on the following day, thanks to the stillness of the atmosphere, the thermometer rose to − 16° C. or 3°.2 Fahr., we felt it relatively warm. We rode hard, crouching all of a heap in the saddle, and leaning forward against the wind, with our arms crossed, and left the horses to guide themselves. Thus we rode, hour after hour, the horses'

* During the course of the extremely interesting and highly successful expedition which Dr. M. A. Stein, of Rawalpindi, made in East Turkestan in the years 1900-1901, principally for archæological purposes, he visited, among other places, the lower Andereh-daria, and discovered there the ruins of an ancient town. One especially valuable find he made consisted of several MSS. I cannot too strongly urge all who are interested in the archæological problems of Central Asia to study Dr. Stein's excellent book *Archæological Exploration in Chinese Turkestan*, Preliminary Report (London, 1901), especially as the thorough investigations made by this inquirer throw a clearer light upon the discoveries which I made in the Lop-nor region. It may be added that Dr. Stein has also just published a more popular account of his journey in *Sand-buried Ruins of Khotan* (1903).

hoofs ringing monotonously thud, thud, thud on the frozen ground.

On the last night of our journey we registered 58° of frost (−32°.2 C. or −26°.0 Fahr.), the lowest record for the whole of that winter. The next day we were in the saddle ten hours; but we started so late in the morning that we had to ride several hours in the pitch-dark night. It was stinging cold, and to make things worse, the wind blew in our faces, not very strong it is true, yet quite strong enough to freeze us stiff as we sat in the saddle. I tried to protect my face with a neck-kerchief, but my breath froze upon it, until moustaches, beard, and nose all became one piece; still it did afford a certain amount of protection. The greatest difficulty was to protect the eyes. The wind made them water, and the water stuck the eyelashes together and froze into tiny icicles, which had to be thawed at intervals to enable us to see at all.

I cannot describe how glad I was to reach the shelter of the beg's house and warm myself at his roaring fire, while I enjoyed a good meal of tea, fresh eggs, bread and honey, and afterwards crept into bed and lay for a couple of hours reading Swedish newspapers, and revelling in the play of the flames upon the walls and roof of the little room. Meanwhile Yolldash lay stretched out in front of the fire, and snored, as well he might do after such a long cold run.

The results of this reconnaissance were less than I had hoped for. In fact, the journey was hardly worth the 13 days I sacrificed to it, though it was not entirely fruitless. I made several important geographical observations, especially with regard to the extent of the sand-belts in that part of the country, the development of the vegetation, the size and direction of the rivers. These last really have a more easterly position than is assigned to them on Roborovsky's map, in consequence of the gentle slope of the Tarim basin towards Lop-nor.

CHAPTER XIX.

AMONGST THE DRY RIVER-BEDS.

THE day we left Cherchen—the 30th of January—to return to Tura-sallgan-uy was anything but seasonable for the beginning of a long journey; wind, dense clouds, snowstorm, and an icy chilling mist, with the thermometer down to −15°.0 C. or 5°.0 Fahr. at one o'clock in the afternoon. We made quite an imposing caravan with our six camels and five horses, especially as we were accompanied as far as the river by a crowd of the good folk of Cherchen. The camels were fat and well rested, and we were again plentifully supplied with everything we needed. I engaged Mollah Shah permanently; he would be a useful man to have in Tibet. He said adieu to his native town and his wife and six children as calmly as if he were only going off for a two or three days' trip. No European who knew he was to be absent for two whole years would have quitted his home in that easy unconcerned way.

Instead of following the usual route along the left bank of the river, we crossed over, and for the first two days travelled along the steppes on the right bank, our object being to reach Keng-laika, the position of which I had determined astronomically.

It was my intention to find out if possible where the old bed of the Cherchen-daria ran. According to Roborovsky, who, however, never saw it himself, it was situated 40 miles north of the existing bed. This was the problem I now had before me, a problem which formed part of my original programme. It turned out that the information which Roborovsky obtained from the natives was untrustworthy and required revision. For to my surprise the shepherds of Keng-laika told me that the more northerly of the two depressions which we had crossed in the desert rejoined the Cherchen-daria at Su-össghen, a day's journey

down the river, and that below that point there existed no ancient river-bed to the north. Of this particular depression we had already taken accurate note during our journey southward across the desert.

On the 3rd February, 1900, we struck away from the Cherchen-daria at a little salt-pool called Shor-köll, and travelled across tamarisk steppes and through dead forest until we came to Chong-shipang, as the farther ancient bed was called. It was very plainly marked, having about the same breadth as the existing river, and formed an almost straight trench in the ground. Its banks were high and clearly defined, and were dotted with tama-

The Ancient Bed of the Cherchen-daria.

risks and scattered poplars, some living, others dead. Beyond this trench stretched the desert for as far as ever we could see to the north.

Further on this river-bed divided into two arms, of which the one on the right hand returned back to the Cherchen-daria, while the one on the left continued to the east-north-east, though it, too, gradually led back to the Cherchen-daria, until it struck it at Su-össghen, the point already mentioned. On the night of the 2nd February the wolves howled fiercely about the camp. They were no doubt hungry, as the intense cold still continued. At all events, we judged it prudent to keep the horses tethered close to our camp-fires.

Having thus proved that there existed no ancient river-bed

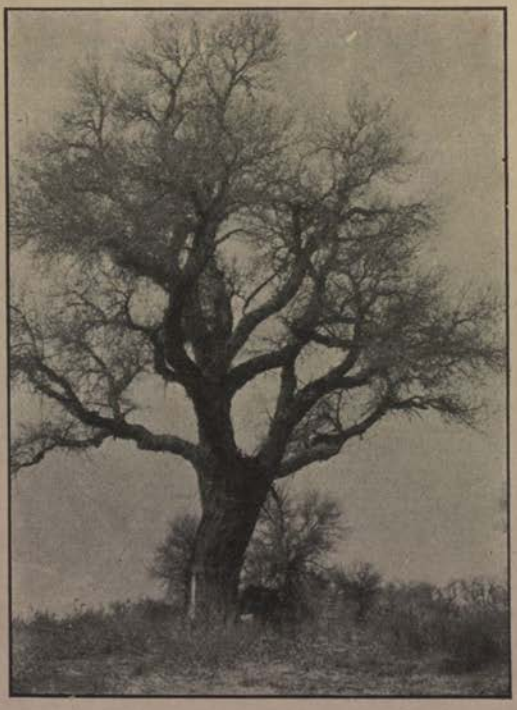
north of the Cherchen-daria, I preferred to travel along its right bank, where there was no recognisable route. And there we did discover a *kona-daria*, or "ancient river-bed," proving that the Cherchen-daria had not always shifted to the right when it changed its channel. Near this abandoned river-bed we encountered, standing isolated amongst the tamarisk groves, the most massive poplars I have ever seen in East Turkestan. They were not more than 20 to 24 feet high, but upon measuring two of them close to the ground we obtained a circumference of 15½ and 22⅓ feet respectively. The trunks proper were not more than 3 or 4 feet high, but upheld bizarre crowns of gnarled and shaggy

An Ancient Tograk beside the Cherchen-daria.

branches. The existence of such trees as these proved that the river must have flowed here for centuries. For, even though we do not accept the natives' computation of age, namely, that a tograk (poplar) lives for a thousand years, then stands another thousand years a dead trunk on its own roots, and finally lies rotting on the ground for yet another thousand years, it may at any rate be safely concluded that these veterans were at least some centuries old. Immediately beyond these ancient trees our guides conducted us to an old Mussulman burial-place, with several *gumbez* (tombs) and the ruins of some houses, the largest of the latter measuring 49¼ feet by 42½ feet. Close by were plain indications of fields having been formerly cultivated,

amongst other things an arik or irrigation canal, now, of course, in great part destroyed.

That evening we encamped near two or three graves which our guides had told us about, and on the 4th of February we examined them more closely. They had been excavated some three years before by shepherds, who, of course, believed they would find gold and other valuables in them. When we came to the place, there were three coffins standing outside a tamarisk cone, within



A Poplar beside the Lower Tarim.

which they had been originally placed. Two of the corpses, an elderly man and a middle-aged woman, were well preserved. The skin sat close to the skeletons and was as tough as parchment. The woman's was especially interesting. The hair, which was in no way decayed and was of a reddish-brown colour, was caught up at the back of her head with a red ribbon. This tint of hair is seldom seen in any Asiatics who would be likely to visit these parts; besides, the women of Asia, at any rate of Central Asia, all wear their hair in long plaits hanging down the back. The skull was of Indo-European shape, with high cranium, straight

eyes, very slightly projecting cheek bones, narrow Roman nose, with elongated, almost parallel nostrils. Beyond a shadow of doubt she was neither of Chinese nor of Mongol blood. Moreover, her dress was not Asiatic at all. It consisted of a coarse linen shift, with tight arms, and the lower part widening out like an ordinary gown. Now the Asiatic women always have loose sleeves and wide trousers, but never wear skirts, which would be a hindrance to them when they ride, for they sit the saddle in the same attitude that men do. Around the forehead of both man and woman there had been a narrow bandage of some thin material, though it was now almost completely rotted away. The woman had red stockings on her feet. In the case of both corpses the nails were cut—not allowed to grow long as is the Chinese fashion.

Of the man's clothing very little was left. His hair was neither partly shaved off nor yet gathered into a pigtail: he could not, therefore, be a Chinaman. Inside his coffin lay an ordinary wooden comb.

The coffins were simple and hastily made, each consisting of six poplar planks, the width being precisely the same as the height, the sides parallel, and the length slightly exceeding that of the bodies. Close beside the coffins stood the remains of an ancient hut, with walls of interlaced brushwork.

All the indications pointed to these people having been Russians, and I jumped to the conclusion, that they possibly belonged to the Raskolnikis (Nonconformists), who a little after 1820 fled from Siberia towards Lop-nor, and of whose subsequent history nothing further is known. The tamarisk cone, inside which the coffins were originally placed, must of course have presented precisely the same appearance then that it does to-day.

Amongst the actual inhabitants of East Turkestan at the present time one often meets types which, by intermixture of Aryan blood, have lost a good many of their Mongol characteristics. But these bodies could not very well be Mohammedan, because the Mussulmans of Central Asia do not bury their dead in coffins. The shepherds declared that several other tamarisk cones in the same neighbourhood were used as burial-places, but they were not able to lead me to any of them. It is possible a Raskolnik colony may have found refuge in this remote part of the world from the persecutions to which they were only too frequently subjected. Unfortunately the coffins were totally destitute of inscriptions.

Leaving these mysterious dead to their last long rest in the wilderness, we travelled on further, partly along the right bank, partly on the ice of the river. The Cherchen-daria did not present the same strongly-scarped outlines as the Tarim, nor was its bed so deeply eroded; but its banks were like those of the Tarim, in that they were bordered by poplars, tamarisks and kamish. The belt of vegetation on the right bank was, however, broader than that on the left bank, for on this side the desert approached nearer. From the river we generally saw the sand-dunes peeping over the shoulders of the forest.

It still continued cold. During the night of the 5th February

On the Bank of the Cherchen-daria.

there were 52 degrees of frost (−29°.0 C. or −20°.2 Fahr.), though luckily we were able to command an unlimited supply of excellent fuel. At the *lengher*, or rest-house, of Ak-ilek we crossed over to the left bank of the Cherchen-daria, the ice cracking ominously under the weight of the camels just over the line where the current still ran. Upon reaching the spot where the Charkhlik-Cherchen road crossed the river, a spot I had already visited in 1896, we had unfortunately to bid adieu to our guides, for they possessed no knowledge of the region we were now about to traverse. In lieu of definite information we had nothing to go upon except an inference from a story which Toktamet Beg, of Cherchen, told me. Once, when he was sitting in his own house, he was disturbed late at night by a knocking at the door, and in reply to

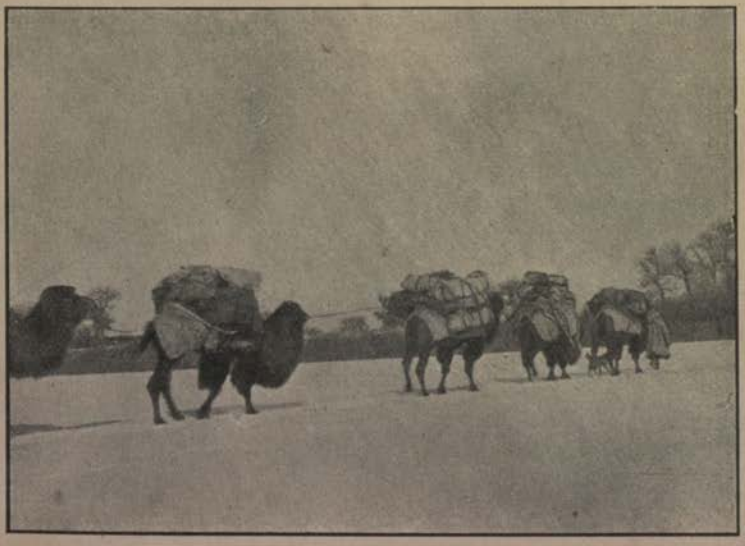
his inquiry a well-known name was given. Thereupon he opened it, and in rushed seven robbers. One of them, who had a drawn knife in his hand, threatened to kill Toktamet if he offered any resistance. Having bound him, they plundered his house, carrying off everything of value they were able to discover, including 2,000 tengeh (about £20) in silver money. Then they fled, taking the beg, still bound, along with them, so that he might not rouse people to pursue after them. The part of this story which specially interested me was that the robbers, in the course of their flight, crossed the Cherchen-daria and travelled north to the Tarim down an ancient river-bed, which obviously must have been the Ettek-tarim. This was clearly not the first time that this particular river-bed had been used as a line of retreat by fugitive cut-throats.

On the 8th February we continued our course down the Cherchen-daria, keeping to the left bank, partly because I did not want to travel in Roborovsky's footsteps, partly that I might ascertain whether any other river-channels branched off or rejoined the principal stream. Thus our road led close along the edge of the forest, across steppe-land diversified with tussock-grass and reeds. The high sand-dunes advanced to within half a mile on the north. The river, it was evident, had often been swollen, for its terraces or scarped banks projected six or seven feet above the level of the ice. In one place, but only in one, the sand-dunes advanced quite close to the river, and terminated abruptly in a wall of sand, which went down some 30 or 35 feet straight to the water's edge. We encamped for the night in one of the few poplar groves we met with.

Young Kurban, who had at first promised so well, now seemed likely to turn out a veritable young rascal. This evening, for instance, as soon as it grew dark, he disappeared. All the animals were in camp, so that he could not be out with any of them, and he had also left his sheepskin behind him, although there were 32½ degrees of frost (− 18°.0 C. or −0°.5 Fahr.). As hour after hour passed and he did not come, we began to fear he had been attacked by wolves. Accordingly I sent men out to look for him. At last, although it was quite late, they came back, bringing him with them. It seemed that, during the march, the young rascal had lost a pair of boots off one of the camels. There was, of course, nothing wrong in his losing a pair of boots, but he ought to have told somebody he was going back to look for them. We

were afraid he had fallen asleep somewhere, and would freeze to death during the night. I bade Islam Bai keep a sharp eye upon my young gentleman, and a good thing I did so, for he turned out eventually to be a full-fledged rogue.

That night offered the first indication that the severity of the winter was past. We had not more than 36 degrees of frost (−20°.1 C. or −4°.2 Fahr.), and during the following day, the 9th of February, the thermometer rose to −7°.6 C. or 18°.3 Fahr. It had never been so warm since the 28th December. The country we were now travelling through was painfully monotonous, and we looked in vain for the slightest trace of human beings. And so it continued on the 9th and the 10th; but at



On the Frozen Cherchen-daria.

last, on the 11th February, we met human beings at the sattma of Aralchi, on the left bank of the river, namely, a man, two boys, and two women, with 600 sheep, 6 cows, and some horses and asses. These people told us that an ancient watercourse which we had followed the day before disappeared at the extreme end of the desert, and in the opposite direction united itself with the Ettek-tarim.

By a lucky chance, Togdasin Beg, my old friend from Charkhlik, found us on the evening of the 12th at a place called Yiggdelik-aghil, having been commanded by the amban of Charkhlik to keep a look-out for me, and place his services at my disposal. He was consequently quite pleased to show me

the way to the Ettek-tarim, along which he had already travelled twice, and he gave me a good deal of information about it, which on the whole agreed very well with what I was told by Kunchek-kan Beg of Abdall in 1896. It was only about 30 years, he said, since the Ettek-tarim was abandoned by the current. Previous to that time one-half of the volume of the Tarim, *i.e.*, the Yarkand-daria, used to flow along that watercourse.

Togdasin Beg told me he had even rowed down it in a boat, although at this time there was not a single drop of water in it. The second time he saw the river was in 1877, when the notorious Niaz Hakim Beg of Khotan, the confidant, and later on the murderer, of Yakub Beg of Kashgar, fled from Khotan to Korla with a caravan of camels, asses, and mules, upon which occasion he, Togdasin Beg, was called upon to guide the fugitive down this *ogri-yoll* or "thieves' road," as it was called, because of its being frequented by those who had very good reasons for desiring to avoid the great caravan roads. The complaisant old beg accordingly acted as our guide, and it was amazing how well he remembered the way, although he had not been there for 23 years. The topographical sense of the natives of East Turkestan is often developed to an incredible degree of accuracy. This old man, for instance, would say to us, if you will go a couple more *yoll* (stages), you will come to a place where there is better pasture. And he was always right.

During their rutting season, which falls in February, camels are savage and dangerous. We had only he-camels in our caravan, and consequently care and vigilance were needed to prevent them from injuring one another. At the camp at Koshmet-kölli, however, two of the brutes got fighting. In their blind fury they beat their heads on the ground, twisted their necks round one another like a couple of snakes, and strained and wrenched, and bit and kicked with all the force they were master of, until the froth flew about them like soap lather. The stronger of the two pushed his head between the fore-legs of the other and tried to heave him over. Had he succeeded, his vanquished enemy would have been lucky if he escaped without serious injury. But before the former could get his opponent over, the men rushed in to the rescue. At such a time, when he is foaming with rage, it is no use tugging at a camel's nose-rope; he pays not the slightest heed to it. The men struck the pugnacious brutes over the nose with thick sticks, until they at last let one another go, and, bleeding and splashed

with froth, and their eyes blazing with enmity, stalked off to graze again. After that we always tied up the fore-legs of the most ferocious when we encamped at night, and whilst on the march kept them muzzled.

On the 14th of February we made a very short march of only 9¼ miles, for as we were about to traverse a waterless region, three marches across, it was necessary to make a fresh start from Bash-aghiz, the last place where water was to be obtained. From that point the northern arm of the Cherchen-daria bent back to the south-east into the lake of Lop-kölli, the only name by which the Kara-buran was here known.

A Shepherd's Hut (Sattma) at Aralchi.

At one o'clock p.m. the thermometer recorded 0°.4 C., or 32°.7 Fahr., the first time since Christmas Eve that it rose above freezing-point. All the same, it sank during the ensuing night to −24°.0, or −11°.2 Fahr. Here, however, the snowfall had evidently not been so heavy, for we saw none except in sheltered places.

Carrying with us a couple of sacks of ice for ourselves and the horses, we directed our steps on the 15th February towards the north-east, and struck the Ettek-tarim at Yulgunluk-köll, or the "Tamarisk Lake." Thence it continued southwards, and formerly entered the Kara-buran, not far from the present fishing-station of Lop. But we followed it in the opposite direction, to the north, finding all day long an abundance of small wood, fresh and full of

sap, although the ground was everywhere as dry as tinder. At Kutchmet, a day's journey due west of Shirgeh-chappgan, there was forest as fine as any alongside the Tarim. The bottom water was, of course, not very far down, as we found, for instance, at the well of Yulgunluk-kuduk, which happened just then to be sanded up. The well itself was dug in the bed of the river, in a hole about 16 feet deep, which had been scooped out by a powerful eddy. Beside it was a trough, the hollowed-out trunk of a tograk, or poplar, for horses and asses to drink out of, showing that this "back-way" was used sometimes, especially, as I understood, by men engaged in gathering *yiggdeh* berries. The sand-dunes which ran alongside the Ettek-tarim were at most 12 to 14 feet high, though later on they rose to 65 feet.

This former river-bed was uncommonly easy to distinguish; it could not well be more than about 30 years since it was abandoned. Not only was it a bare trench bordered by dense woods and thickets, but the last channel in which the water actually ran was clearly distinguishable as a winding grip lying even deeper; and occasionally some of the drift-wood still stuck fast in the bottom.

Here I may mention *en passant* two or three features of a physical geographical nature which tended to illustrate my views as to the migratory character of the lake of Lop-nor. In the first place, the circumstance, that the Ettek-tarim was accompanied by vigorous poplar woods, while the corresponding part of the course of the Tarim proper was destitute of forest, proved that the latter was of such recent formation that there had not yet been time for any forest to grow up. In the second place, the huge accumulation of drift-sand, which overhung our camping-ground that night, and which bore the significant name of Tagh-kum, or "Mountain Sand," proved that in ancient times there was no Tarim to the east of it; for if there had been, it would have been impossible for the dominant east wind to pile up such stupendous masses of sand in that situation. But this becomes no longer impossible, if we assume the Tarim to have entered the old Lop-nor, that is the lake, now dried up, which lay to the north of Kara-koshun; for there was at that time nothing to prevent it doing so. Thirdly, the sand between the Ettek-tarim and the lower course of the existing Tarim decreased materially in proportion as we travelled northwards from Tagh-kum; in other words, the drift-sand was unable to accumulate on the exposed side of the ancient lake of Lop-nor.

The belt of vegetation which accompanied the Ettek-tarim was about two miles wide, and was fenced on the east by high steep sand-dunes, whereas on the west the dunes had a gentle ascent right up to the immense promontories which we encountered in the interior of the desert.

Whilst the men were engaged in loading up on the morning of the 16th of February, I climbed to the highest summit of the Tagh-kum, some 160 to 200 feet above the woods, and from there obtained a splendid bird's-eye view of the surrounding country. North-east stretched a bayir of the usual type and with the usual characteristic concentric water-markings, or former lake-levels.

A Poplar Grove in the Delta of the Tarim.

On the east the depression was shut in by a wall of sand, which, however, was only half as high as the Tagh-kum, and sloped away east towards the right bank of the Tarim, distinguishable by the darker colouring of its forest-belt. Beyond that again was sand, with its steeper faces always turned towards the west.

It is a pretty obvious inference that these bayirs occur all over the desert, and owe their origin to the action of the wind. As yet the dunes which had managed to establish themselves in the bed of the Ettek-tarim were only insignificant, but in its accompanying forests they were 10 to 12 feet high. To this extent the ancient watercourse is still protected from the gigantic ocean of sand which is slowly approaching it and threatening to engulf it. Indeed the process of engulfing has already begun, for

the Tagh-kum has actually invaded a portion of the bed of the Ettek-tarim, and farther north the latter was frequently hidden underneath the encroaching sand. The bayirs are not stationary, but travel westwards across the level plain of the desert, having their origin on its eastern boundary, near the Ettek-tarim, and disappearing in the far west, where the winds are less regular, as well as subject to other laws than the winds in the Lop country. Thus each bayir maintains its identity during the whole course of its existence, although the soil of which it is composed is renewed every century or so—assuming that the sand-dunes travel at the rate of 15 or 16 feet every year. Thus, though the "waves" of the desert sand obey the same laws as the waves of the ocean, there exists, nevertheless, a great dissimilarity between them. In the case of the latter it is only the wave-movement which is transmitted onwards, the water retaining its position; whereas in the case of the sand-waves the material travels as well as the wave-movement, being flung forward and then poured on over itself. And if the wind failed to bring up fresh material, the existing sand would be all swept away.

As we advanced farther towards the north the forest gave signs of dwindling away, as though its roots experienced difficulty in getting down to the bottom-water. Notwithstanding that, it was still thick, and some of the trees measured as much as 8 feet in circumference. The belt on the right bank was, however, beyond comparison more luxuriant than that on the left bank, owing to the greater protection it enjoyed against the wind; whereas the belt on the left bank was being gradually choked and smothered by the sand. Six swans, the first harbingers of spring, were seen flying towards the north-west, and the temperature rose to 4°.2 C. or 39°.6 Fahr. One of the localities we passed on this day was called Kulchak-kölli, pointing to the former existence of a lake, which has now disappeared.

During our last day's tramp along this instructive watercourse dead forest became quite as common as living, and the work of desolation was in general farther advanced, for the sands on both banks closed in to within 350 yards of each other. Indeed, in some places they had even flung bridges of small dunes across from the one bank to the other.

At length, at Bash-arghan, we once more struck our old friend the Tarim. How small and insignificant it appeared as compared with the mighty stream which had impressed us all so much in the autumn! Ice-bound and motionless, it resembled

a narrow canal, without any alluvial formations. The sheet of ice which covered it was like a flat, shallow gutter, for the edges were higher than the middle, owing to the river having dropped since it became frozen. When it first froze it was 141 feet across; now, however, it only measured 77½ feet. As the camels had had nothing to drink for three days, we hewed a hole in the ice to get water for them, and found it was more than 20 inches thick. Thence we travelled through forest, thickets, and brushwood to Arghan or Ayrilghan, where we encamped for the night.

Sunday, the 13th February, we rested. We were now at the

Watering the Horses at a Hole cut in the Ice.

confluence of the Tarim proper and the Koncheh or Kunchekkish-tarim. The former was 194 feet broad, the latter 79 feet, and the united stream, which flowed into the Kara-buran, 252 feet wide. Our camp was pitched in the angle between the Tarim proper and the united stream. This spot I visited twice subsequently, and thus it became of importance as a fixed point for checking and controlling my topographical and astronomical observations. Here that fine old fellow Togdasin Beg took leave of us and returned home, but eighteen months later he again rendered us important services.

CHAPTER XX.

TURA-SALLGAN-UY—THE BURIAT COSSACKS.

I DO not propose to weary the reader with a description of the network of waterways which we threaded on our way back to Yanghi-köll. A more intricate and labyrinthine hydrographical system it would be impossible to conceive. No river possesses a more tangled complex of waterways than the delta of the Tarim. It would be impossible to make it perfectly intelligible without a detailed map, and that it must be a work of the future to prepare. Names ending in *köll* = "lake," *choll* = "pool," *dashi* = "salt-pool," *akhin* = "stream," and *kok-ala* = "river-arm" occur repeatedly, even in those tracts which are now completely desiccated.

At the village of Sheitlar we observed an old woman beating rushes (*chiggeh, i.e., Asclepias*) until its fibres became as thin and soft as cotton; this material would then be woven into a coarse but strong material. She told me that her parents had lived beside the Chivillik-köll at a time when it was a much larger sheet of water than it is now, and even now it is the largest lake that the people of that locality are acquainted with.

Our route now lay to the north-west, across steppes and through woods, thickets, and fields of kamish. At Arelish the Kunchekkish-tarim split into two arms, the more easterly of which entered the lake mentioned just above, and the western one was the Kok-ala, which we skirted for some distance.

Although the thermometer dropped at night to −18°.8 C. or 1°.8 Fahr., the days were steadily growing more spring-like. On the 21st February we reached Dural, the headquarters of the amban, or Chinese governor, of the Lop country; and on the 22nd Tikkenlik, where we were met by Kirgui Pavan, the man who in 1896 showed me the way to the large lakes that lay to the east, and so furnished me with the opportunity of making

the very important discoveries I then made. At Tikkenlik I again took up my quarters in the house of Naser Beg.

We experienced another stroke of luck at Turduning-söresi, for we found there, encamping in the forest, a man with eight camels, named Abdu Rehim, from Singher in the Kurruk-tagh. Now my next expedition was to be to the dry river-bed of the Kum-daria, and I wanted a guide. This river had been touched in a couple of places by both the Russian traveller, M. Kozloff, and by myself; but beyond that nothing was known about it. Now this Abdu Rehim was, it seemed, the same man who guided M. Kozloff to the well of Altimish-bulak in the Kurruk-tagh,

Reed Huts at Sheitlar.

that being, as it happened, the nearest well to the Kum-daria. In fact, he was one of the only two or three hunters in all that region who had ever penetrated as far as Altimish-bulak. But the man had a pretty high opinion of his own importance, and it was not easy to come to an understanding with him. I offered to buy his camels, but he asked an altogether unreasonable price for them, especially as they were not to be compared with ours. Islam Bai, who in his dealings with his co-religionists showed something of the arrogant despotism of Tamerlane, came to blows with Abdu Rehim over this matter. Now the latter did at first give the impression of being something of a freebooter and turbulent fellow. But when he was going off in a tempest

of rage, I called him back, and we eventually came to terms—without assaulting one another. I agreed to hire six of his camels at the rate of half a sär (1s. 6d.) a day for each animal; and Abdu Rehim agreed to guide me by way of the Kum-daria as far as Altimish-bulak, after which he was to be at liberty to continue his journey to his own home at Singher. His camels were carrying no loads, for he was on his way home after taking his sister and her dowry to a beg at Dural. Islam Bai prophesied that I should have trouble with this man; but he was wrong, I had no trouble with him whatever. This was the first time I ever had occasion to find fault with Islam; but it was not the last.

After this acquisition—some of Abdu Rehim's animals were she-camels—it was no easy matter to control our own, especially a big Bactrian he-camel, which was very restless and kept trying to bite his companions. In fact, he turned quite wild, and the froth hung about his mouth as if it had been lathered by a barber. He screamed and wept in the most plaintive and melancholy way possible; and whenever we encamped we tied him to a poplar tree, not only by his nose-rope but by strong lashings round his feet.

During our last day's march, the 24th of February, we were met by troops of villagers from all over the district, by begs with their attendants, by scouts and couriers. They were all pleased, and even amazed, to see us come back again alive, after witnessing us disappear in the desert so silently, and without leaving a trace behind us. Then came, dashing up at the gallop on their black horses, three Cossacks in full uniform, a dark green colour, with high, black lambskin caps, and bright riding-boots, and with their sabres suspended over their shoulders. They were Sirkin and the two new Cossacks from Transbaikalia. In spite of their pronounced Mongol features, the new-comers made a fine show as they reined in their smoking horses, which they sat and managed with masterly skill. Compared with them, I was a perfect tatterdemalion. Pulling up in front of me, they saluted and presented their respective reports.

Sirkin, whom I had left in command of the camp during my absence, reported that one of the camels had run away, and that one of the greyhounds had been seriously hurt whilst in pursuit of a wild boar. Except for that, all was well.

The elder of the two new Cossacks reported that he and his comrade had been ordered by their commanding general at

Chita to come and join me in the country of Lop. They were both pure Buriats, and their language differed but little from Mongolian; but they could also speak Russian fluently, and during the time they were in my service they learned to speak excellent Jaggatai Turki as well. Their names were Nicolai Shagdur and Tseren Dorshi Cherdon, and both were 24 years of age. They belonged to the army of the Transbaikal Cossacks, a force which consists to a considerable extent of Buriats. Their term of service was four years, of which they had served only about the half when they received the welcome command which sent them half-way across Asia to serve me, in a country and amongst a people whom they had never seen before. They had been given their pay for the two remaining years of their term of service, namely, a thousand roubles (£106) in gold, for the Tsar desired that my escort should be no expense to me. However, I took charge of the money for them, found them in everything so long as they were with me, and at their departure gave them back their thousand roubles, besides other gifts, so that from the monetary point of view they did very well by the expedition. But they fully deserved all they received: their services were simply invaluable, and their conduct beyond all praise.

It had taken them four and a half months to travel all the way from Chita, using railway, diligence, post-horse, and Turkestan arba (cart). They carried passes dated "Chita, the 20th of September (o. s.), 1899, and being Cossacks in active service, they travelled free so long as they were in Russian territory. Their route had lain through Irkutsk, Krasnoyarsk, Ob, Barnaul, Sergiopol, Kopal, Jarkent, Kulja, and Urumchi; but there they had been detained two months by the great Chinese scholar (now dead) Consul Uspensky, who had lost traces of me, and did not know exactly where to send them on to.

The Buriat Cossacks, after completing their term of service, during which they become thoroughly Russianized in both speech and discipline, return to their stanitzas or settlements, resume their native dress and native manner of life, and live principally by breeding cattle. The stanitza of my two men was Ataman Nikolaievska, situated 130 miles north-west of Troiskosavsk, near the southern end of Lake Baikal. I believe that both these men, Shagdur and Cherdon, would have laid down their lives for me, and I became as much attached to them as I was to their comrades from the west. Shagdur, in

particular, was the beau-ideal of a man, and a good and faithful servant.

Properly speaking, I ought now to have sent back the two West Turkestan Cossacks, Sirkin and Chernoff, to their quarters at Kashgar, for I was only authorised to keep them until the arrival of their Buriat comrades. But I had taken such a liking to them, and had learnt how honestly and conscientiously they carried out the tasks I set them, that I could not reconcile myself to the idea of parting from them. I wrote therefore to Consul-General Petrovsky, begging him to appeal on my behalf to the proper authority that I might retain the two men, and in the sure hope that my request would be granted, I kept them with me until I heard something further concerning them.

But to return to our last day's march back to Tura-sallgan-uy. Upon arriving there, which we did in the company of an imposing escort, we found, assembled in the "market-place," a large company of our neighbours and the remaining Cossack, Chernoff, for it was an inflexible rule that one of these men should always be on guard. During our absence the camp had been enlarged, and another tent put up. Everything was clean and tidy in honour of our return, my hut all in order, and a fire burning in the stove inside the tent. All the animals were in first-rate condition—the mules fat and plump, and both the camels and the dromedary had put on flesh. But these latter had grown wilder, the dromedary in particular. He screamed in a "ghostly" and rumbling voice, most painful to listen to; and gritted his teeth, and ground them till the froth dropped off in big flakes, and he rolled his eyes and tried to bite. He would not allow anybody to go near him except Faisullah. We kept him tethered by each leg to a stake driven into the ground, so that the poor beast was unable to move.

As soon as the men knew that one of the camels had run away, Parpi Bai set off after him. But although he followed his track for a whole fortnight across the Koncheh-daria, and along the Kurruk-tagh as far as Shinalga, and thence to Kuchar, he eventually lost him. Later on we heard that he made for the valley of Yulduz, and was there appropriated by some Mongols. At any rate, we never saw him again. This was the only time that a camel ever actually ran away from my caravan. But both Turdu Bai and Faisullah, who had had several years' experience of camels, and were perfectly familiar with their habits, told me that a camel will sometimes be frightened out

Chernoff, Sirkin, and Shagdur.

of his wits by a tiger or a wild boar, and, in a panic of terror, will flee as though the devil and all his imps were after him. Evidently something of the sort had happened to our camel. Tigers did occur in that district, for one of our friends, Mirabi, caught one in a trap not very far from our camp, and brought him just as he was, frozen and stiff as a wooden horse, and set him up in the midst of our market-place; and after he thawed in the spring, we flayed him and kept his skin.

About this time the number of my live-stock was increased by the addition of a cat and two new-born pups, which Pavan Aksakal gave us. They were called Malenki, or the Little One, and Malchik, or the Boy, because they were so small and so pretty; and these names clung to them after they grew up and became veritable giants of their kind. They turned out first-rate caravan dogs, and I and they were always the best of friends. Our poultry, too, had multiplied, adding yet another element to our rural prosperity. Besides these we had a falcon and the goose which travelled with us on the ferry-boat all the way from Lailik. The latter seemed to have entirely forgotten its former relatives, the wild-geese, and paid no further attention to them.

Ever since the middle of February the wild-geese had been returning. They were the same flocks we had seen travelling towards India in the autumn; only they were now going in the opposite direction, pursuing the same course, crossing the same rivers, the same lakes, flying over the same poplars and the same belts of forest, which they know generation after generation. Their great highway is the Tarim; it is extremely seldom that they take a short cut across the desert. We now began to hear them flying in vast numbers over Tura-sallgan-uy. We heard them screaming and chattering at all hours of the day and night and in all weathers. We saw them by day, in calm and in storm, equally whether the sun was hidden or whether he glinted out through the tempestuous skies. We heard them when it was pitch dark at night, and the black clouds prevented the light of the moon and stars from reaching the surface of the earth. And they were always driving along at the most desperate speed, never stopping, never resting. The Lop-men aver that the same colonies return year after year to the same breeding-places, and that they recognise certain laws and rights of possession, just as the Lop-men do themselves. Thus they are absent during the four months of extremest cold, during which all the rivers and lakes of East Turkestan are ice-bound.

There was no lack of game. The Cossacks went out shooting every day, and never came back empty-handed. They killed several wild boar, and brought home pheasants, wild-duck, wild-geese, and occasionally a roe-deer. We were kept well supplied with all sorts of country produce, such as eggs, milk, cream, mutton, poultry, hay, and so forth, and we always had a super-abundance of fish. And in the forest there was any quantity of firewood to be had for the fetching; and for that purpose we had plenty of camels.

Our camp at Tura-sallgan-uy thus became an important market, well known throughout all the Lop country, and immediately outside its precincts there grew up a ring of small "suburbs," where tailors, smiths, and other handicraftsmen came and plied their several trades. In one of these establishments, that of Ali Ahun, a tailor from Kuchar, a little sewing machine rattled briskly all day long. Parpi Bai, who was a saddler by trade, took up his quarters near the stables, and kept himself busy making new pack-saddles for the camels and mules. Merchants came from Kuchar and Korla, bringing such wares as they believed we should be likely to want, *e.g.*, sugar, cube tea, Chinese porcelain, Russian tea-cups, cloth, and so forth. One of these men, a merchant from Andijan in West Turkestan, built himself a straw hut and hung its walls with red cotton stuffs from Russia, and had ranged about him stacks of cloth, chapans (cloaks), caps, boots, etc., exactly as in a store in a bazaar. This shop became immensely popular, and there were nearly always some of my men, Cossacks as well as Mussulmans, inside it, talking, drinking tea, smoking, or bargaining.

And then the throng of wayfarers who came that way! The great caravan road ran of course through Jan-kuli, but Tura-sallgan-uy proved to be a formidable rival to that place, and gradually travellers began to come our way. And when they did come, they all felt it incumbent upon them to stay the night; for it was quite a *tamashah* or "spectacle" for them to observe how we lived and what we did. Every day horsemen rode into the market-place, and offered their horses for sale. and some of them we bought.

Thus our little town grew with American rapidity, and there was an incessant coming and going, bustle and noise, until quite a late hour every night. The market-place was lighted by a single big Chinese lantern, which was never put out until our

Dragging the Canoes Overland (*vide* p. 397).

last visitor had gone; after that the only sounds were the tread of our sentinel and the barking of the dogs.

During my absence Sirkin had kept the meteorological register with exemplary correctness; and as it would be advantageous to have as long a series as possible of these observations taken at one place, I ordered him to remain and take charge of the camp during my absence on the forthcoming expedition, and at the same time continue his meteorological work. But I took Chernoff with me, for he excelled in the preparation of cutlets and *pilmen*, this last consisting of pieces of meat boiled in dough.

During the short time of our stay at Tura-sallgan-uy the weather was perfectly winterly. The first real *kara-buran*, or "black tempest," of the year came as early as the 25th February, and I felt how pleasant a thing it was to sit inside my own house-door and listen to the wind whistling through the reedy walls of our huts, and threatening the life of our only poplar. Drift-sand and dust swept down the Tarim and made the air so thick that we were unable to see the steep dune which faced us on the opposite bank of the river. On the 26th of February it snowed, the snow being hard, and round, and small, and it struck against the tent-cloth like pellets of shot. The country was once more white all over, and the dune, when we were again able to perceive it, looked like a snow-covered mountain range. At length, however, the weather cleared up, and I set about my astronomical observations; and also found plenty to do in developing negatives. Tura-sallgan-uy was the most important centre of all for controlling my cartographical work.

On the 4th of March the temperature rose to 7° C. or 44°.6 Fahr. The strong ice panoply in which the river had been so long held spell-bound, now began to turn soft, and not only did the melted water stand upon it, but it swept along it like a tidal current. Our big ferry-boat, which was frozen into the first ice, was listed over, so that her gunwale was level with the surface, and she gradually became half full of water.

Presently a rift appeared in the ice, showing first where the current ran strongest. We warned Sirkin and the men who were staying behind with him to be watchful and on the alert when the early spring freshets came. I especially directed them to have all my boxes on board the ferry-boat in case the camp should be threatened with an inundation; in that way

they would be able to move to some safer place, should the danger become serious.

I now dismissed the unlucky young Kurban, who disappeared the moment he was in possession of his wages. I learnt subsequently that the young rascal had a "rare old time of it" on his way back to Kashgar. At Kuchar he went to the serai, or rest-house, of the Andijan (West Turkestan) merchants, and represented to them that he was travelling as my express courier to Consul Petrovsky, whereupon the good-natured traders gave my young gentleman everything he wanted. In Aksu he became too intimate with the young wife of a beg, and was beaten, but met with lenient treatment at the hands of the Chinese amban, who no doubt thought it would be only prudent to show politeness to the courier of a European. After that Kurban stole a horse in Aksu, and took his departure secretly on its back. But it was in Kashgar that his effrontery reached the greatest lengths; for he went to Consul Petrovsky and tried to put upon him a cock-and-bull story about his having been robbed. He pretended to be plunged in the depths of despair, and asserted that I had entrusted to him, for conveyance to the Consul, a packet of specially important letters, but that he had been attacked on the road by a band of robbers, who took away from him both the package and what money he had. But this was not the first time that Consul Petrovsky had heard these sort of tales, and before my fine gentleman knew where he was he found himself behind the bolts and bars, with plenty of leisure to reflect upon the untowardness of his fate. This was the sole reward he earned by his hardihood. As for the simpletons who let themselves be cheated by him on the road, they had to suffer for their imprudence, unless they managed eventually to get a *quid pro quo* out of young Kurban himself.

This time I left Islam Bai behind me in the camp to act as foreman of the Mussulmans, and I instructed him and Sirkin, as soon as I had started, to go to Korla and buy twenty-five horses and some mules, besides a stock of provisions for our use later on in the summer, when I proposed to make an excursion into Tibet.

IV.

Lop-nor and its Sister Lakes.

A Reedy Wilderness in the Desert.

CHAPTER XXI.

THE KURRUK-TAGH AND THE KURRUK-DARIA.

As soon as the weather began to feel spring-like, I sent Faisullah and Abdu Rehim on in advance with the camels and heavy baggage to Dillpar on the Koncheh-daria, instructing them to cross the river in good time, find good grazing, and then wait until we joined them. I started myself on the 5th March, accompanied by Chernoff, Ördek, and Khodai Kullu, a Loplik who remained in my service fully a couple of years, besides a perfect crowd of uninvited attendants. In addition to the ordinary baggage, I took this time two tents and a stove, a case full of scientific instruments, two cases containing the cooking appliances, and two sporting rifles. Khodai Kullu, who had the reputation of being a great hunter, carried his own weapon. The Osh jighit, Musa, also went with us for the purpose of taking back several of the horses, when we reached Ying-pen on the edge of the desert.

Our first stage in this new expedition led obliquely across the steppeland which stretched northwards between the Tarim and the Koncheh-daria. As is almost invariably the case when a caravan makes a fresh start, it was late in the day when we really got under weigh. There is always so much to arrange and settle, and a number of petty details to be seen to, just at the last moment. The three Cossacks who were staying behind, and all the Mussulmans, were drawn up in a line to say good-bye to me. As I was going off I warned Parpi Bai not to fall too deeply in love with any of the daughters of the land, for he had a reputation that way. He smiled as he stood there, straight and strong in his lusty manhood, dressed in that becoming blue chapan of his, and answered, that I might be perfectly easy on that score. And the poor fellow was right. His love affairs were over, for twelve days later he died after a very short

illness, and was buried with great solemnity in the peaceful graveyard of Yanghi-köll, amid the sorrow and sympathy of his comrades and the native inhabitants of the place; and his grave is now marked in the usual way by an array of little fluttering flags and yaks' tails.

Thus Parpi Bai never had an opportunity to distinguish himself during this series of expeditions in the same way as he did during the former series, when he was in the full prime of his manhood; but for all that I have none but pleasant recollections of him, and shall not readily forget him. Some of those who have at different times been connected with one or

Bash-tograk.

other of my caravans I may indeed forget; but never the men who have died in my service. They will always have a warm place in my heart, for they have fallen faithfully at their posts, and have given me all they possessed—namely, their own lives. Peace be with thy ashes, my faithful Parpi Bai, and may thy last long slumber at the foot of the desert dunes never be disturbed!

It was quite dark before we saw Faisullah's fire flaring up between the poplars on the bank of the Koncheh-daria. We encamped on the left bank of the river among the woods of Dillpar, and stayed there all the next day, partly that I might measure the volume of the stream, although it was still frozen hard, and partly that I might take certain astronomical obser-

vations. In the morning I sent back the begs who had guided us thus far, and thenceforward we were left to our own devices.

The current, which was now flowing underneath the ice of the Koncheh-daria, had a volume of 1,353 cubic feet in the second, or very little more than one-half the quantity which always flows, summer and winter alike, underneath the bridge at Korla. The breadth extended to 118 feet, the maximum depth was 19½ feet, the thickness of the ice 1½ inches, and the transparency of the water 7½ inches. Luxuriant kamish-beds lined the right bank of the river; on the left bank stood a vigorous forest.

A Tamarisk Thicket.

We were once more on the move on the 7th March, steering towards the north-north-east. The *personnel* of my caravan consisted of the following:—Abdu Rehim and his two younger brothers, with eight camels, six of which were in my hire—the other two were ridden by their owners; Faisullah, with five camels; Chernoff, Ördek, Khodai Kullu, and Musa, each on horseback; and lastly myself, mounted on the same strong little horse which had carried me through the Desert of Cherchen. Yolldash and Mashka accompanied us to keep guard at night.

Shortly after leaving Dillpar we crossed three successive deserted channels of the Koncheh-daria. Beside the last of them three huts were still standing in a state of good preservation.

Turning our backs upon the woods of the Koncheh-daria, we rode across a hard plain, the surface of which was impregnated with salt, and covered with a thin layer of sand, which crunched under our feet. It was also dotted about with tamarisks. On the way we struck the little oasis of Bash-tograk, with some huge, but now decaying, poplars, some of them as much as 12¼ feet in circumference. West of that stood a *tora*, or "road-pyramid," towering conspicuously above the plain, and visible to a great distance. It marked the ancient highway, called by the inhabitants of Lop Kömur-salldi-yoll, *i.e.*, "the road where coal was spread," which ran from Sachow to Korla along the northern shore of the old lake of Lop-nor. In *Through Asia* I had occasion to describe that part of this great highway which extends north-west from Ying-pen to Korla. One of the objects of my present excursion was to examine its eastward continuation on the other side of Ying-pen.

No sooner had we turned our backs upon the last of the tamarisk mounds than the surface assumed the character commonly found at the foot of the mountain-chains of Central Asia—namely, in the native tongue a *sai*, that is to say, a gentle slope, almost imperceptible to the eye, but as hard as asphalt, utterly barren, and strewn with fine, thinly-scattered débris. The ground was furrowed by a dry watercourse, which came out of a side-glen of the Sughett-bulak. This was the point we were aiming for, as it would afford us a convenient path to the foot of the mountains. Although we were able to make out their outlines quite distinctly in the morning, the sun would rise again and set a second time before we could reach their actual slopes.

The desolate *sai* extended like a sea on every side of us. We were still just able to follow the outline of the Koncheh-daria in the south by means of its dark belt of accompanying vegetation. The only signs of animal life were a few timid deer, which made off the instant they were shot at. Gradually the ascent became more noticeable, though the ground at the same time grew more stony. The watercourse contained some drift-wood, fragments of tamarisks and willows, which had been swept down by the torrents after rain, the so-called *sils*. As we advanced, the sides of the Sughett-bulak, that is to say, the faces of its scarped terraces, approximated closer and closer together, and the bottom of the stream became more uneven and irregular.

Finally the mountains closed in on both sides; we were in

the mouth of the glen of Sughett-bulak, which takes its name of the "Willow Spring" from a solitary willow that stands beside it. The little brook which came down the glen, and which originated in another spring a day's journey higher up, carried 3 cubic feet of water in the second. We did 20½ miles that day, and the temperature rose to 13°.1 C. or 55°.6 Fahr., so that we had no need of overcoats or cloaks except in the evening. We were now within two days' journey of the nearest Mongol nomads. There are always some of them in the large valleys that lie embedded amongst the parallel ranges of the Kurruk-tagh, where excellent pasture is said to exist.

The Pool at Kurbanchik.

It was a splendid place to encamp in; a fresh breeze blew down the glen all night. This was the first night of the year in which the thermometer did not sink below zero; its maximum was only 1°.3 C. or 34°.3 Fahr.

Our next day's march led eastwards along the foot of the mountains and across an infinite number of dry watercourses. We saw hares, antelopes, and *arkharis*, or mountain sheep; but when Chernoff tried to get a shot at the last named, they disappeared into a ravine with great agility and ease. On our left we passed a continuous panorama of mountain scenes, peak after peak emerging and disappearing in endless succession. The most conspicuous of these were all entered on my map,

their bearings being taken from divers different points. The summits of the main chain were, however, screened by the flanking ranges, and we only saw them in occasional peeps up the transverse glens. The colouration continually changed, shifting from brown to violet, then to red, grey and yellow in regular succession, and it was influenced too by the shadows cast by the airy clouds as they flitted in front of the sun.

On the right the surface fell away slowly towards the plain through which the Koncheh-daria meandered towards the lake of Kara-köll. But we were no longer able to discern its forest-belt. The horizon kept changing—it brightened, grew blurred, disappeared in the mist, melted with the sky. After crossing over several shallow rivulets, separated by rolling country, we came to the edge of the deeply eroded glen of Kurbanchik, some 130 feet down below our feet. To the north was the broad, wide-open glen-mouth; to the south the clay terraces loomed up like black walls. Behind a projecting shoulder of the mountain lay a pool of beautifully pure water, of an emerald green colour, and so deep that the bottom could not be seen in the middle. It was fed by a little brook, carrying 3 cubic feet in the second, which entered at its upper end, but left it again at its lower end. In fact the pool was a miniature Bagrash-köll—the lake near Kara-shahr over on the other side of the Kurruk-tagh. It was situated at the very extremity of a deeply eroded side-glen, and after rain the water must pour into it like a waterfall, because there was a big drop from above. Yet, as rain is a great rarity in these "Dry Mountains"—for that is what Kurruk-tagh means—it must have taken a very considerable time to scoop out this little gathering-basin, especially as the surrounding mountains were composed of diorite.

At Kurbanchik we were said to be two and a-half days' journey from the crest of the main range, by a track or mountain path which led up to a pass called simply Davan (Pass), or by the Mongols, Többveh. From the summit it was another one and a-half days to the Bagrash-köll.

On the 9th of March we travelled a good distance down the glen of Kurbanchik before we found a side-glen by which to climb up the eastern side. After that we pressed on towards the south-east over broken steppe-land, dotted with an occasional clump of grass; then, after threading a labyrinth of low hills, we descended into a dry ravine, which wound between rounded

heights of some soft material, though further on this gave place to hard rock. Just before the ravine opened out upon the level and desolate *sai*, we encamped in a delightful little spot known as Tograk-bulak, which consisted of a poplar grove and a well, the latter being covered with thick ice pierced by a forest of reed-stalks. It was a spur of the Kurruk-tagh which we had just cut through by means of this ravine.

After that we continued towards the east, hour after hour, having the mountains always on our left. Although not trenched by any deep or large watercourses, the *sai* was nevertheless furrowed by an immense number of tiny runnels, generally

Tograk-bulak.

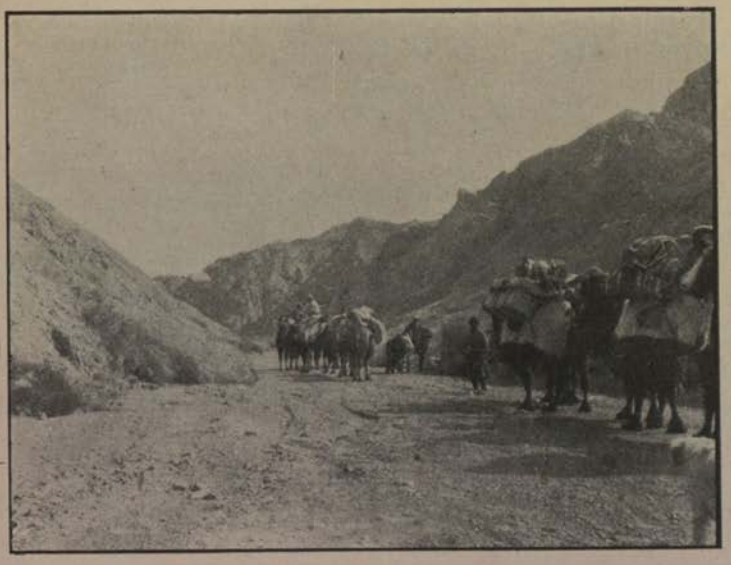
about one foot deep and filled with débris, which was anything but pleasant for the soft pads of the camels' feet. The sun set a ball of fiery red ; it became dusk, and still we were a long way from the place where the next well was said to be. Our guide just now was Khodai Kullu, who had visited this locality before, and we continued to follow the directions which he shouted to us until far on into the night. At last we reached the margin of another big glen, and down its steep side the camels scrambled, or rather slid for the most part. However, when we got to the bottom there was not a drop of water to be found anywhere. We had mistaken the glen in the darkness ; but as we had already done 26 miles we encamped where we were.

Next morning we discovered that we were not so very far out of our reckoning after all, for the spring of Bujentu-bulak was only half-a-mile farther on, and the animals were at once taken down to it. I was awakened at sunrise in rather an alarming way. Chernoff came in, and lighted the stove, as usual, whilst I was still asleep, but he failed to notice that the breeze which came down the glen was pressing the tent canvas against the heated stove-chimney. I was awakened by an unbearable warmth, and opening my eyes saw the tent in flames. At the same moment the men came rushing up and pulled over the tent, whilst Chernoff dragged out the packing-cases, papers, and other things that lay scattered about inside it. Nor was I idle; for, seizing a felt cloth, I set to work to smother the flames, and eventually got them out. After this misadventure my breezy domicile looked the reverse of comfortable. However, the men took a piece of sacking, and having clipped away the burnt edges of the canvas, sewed a patch on. Beyond that, fortunately, nothing was damaged.

The brook which came down the glen of Bujentu-bulak was divided into several arms, all rippling along underneath a broad covering of ice.

When we started again we turned our backs upon the mountains, and steered our course towards the south. In the distance was the *kona-shahr*, or "ancient town" of Ying-pen, standing out in relief against the blurr of the sandy desert behind it. The ruins of this ancient town were ranged on a line running due north and south, so that I was able to examine them, and measure and sketch them, without deviating from our line of march. The first we came to were two *toras*, or "towers of clay," each 14¾ feet high and 49¼ feet in circumference. Next, on a terrace, the outer face of which had been washed away by an inundation, was a *guristan*, or "burial-place," about 200 years old. The graves were marked by monuments of sun-dried bricks (adobe), shaped like cigar-boxes, and the position of the skeletons—the feet towards the south, the head towards the north, with the face turned in the direction of Mecca (*kebleh*)—proved that it was a Mussulman burial-place. Owing to the façade of the terrace having been swept away, several of the graves were open, and showed the skulls of their occupants, peeping out as if through loopholes in a wall. One skeleton, that of a youth of about 15, had fallen out altogether. Close beside this burial-place stood something which

might have been indifferently a *mesjid*, or "smaller mosque," a *khanekah*, or "prayer-house," or a *gumbez*, or "domed tomb" of some person of consequence. It consisted of three walls without a roof, and the fourth wall had clearly been swept away by a flood, like the face of the terrace. The back wall was 19½ feet long and 13½ feet high. In close proximity to these ruins we picked up a quantity of fragments of red and black earthenware jars, on some of which a round ear still remained. After that we came to a *tora*, about 26 feet high and 103 feet in circumference, and then to seven others of smaller size, crowning an isolated hill. Either these last were intended as monuments



On the Way to Bujentu-bulak.

to mark graves of distinguished men, or they were Chinese *pao-tais*, or "mile-stones," which by their number were intended to indicate, as is still the practice at the more important road-stations of Central Asia, the distance in *li* to some other notable road-station in the same district.

But the most interesting ruin of all was a circular wall, precisely similar in appearance to those which I had formerly examined at Sai-chekkeh and Merdek-shahr. It was constructed of sun-dried clay (adobe), held in position by a framework of horizontal beams, and was pierced by four gates. Its diameter was 597 feet, the thickness of the wall 36 feet, and its height 21½ feet. The gates were situated at the four points of the

compass. In the centre of the inclosure was a small pyramid of clay.

What object such a wall could be built for is not easy to say. It was too small for a town wall; besides, there were no signs of any dwellings having ever existed inside it. If it were a fort, the four wide gateways were surely unnecessary. Hence, I am disposed to look upon it as a kind of caravanserai or post-station, the inhabitants of which dwelt in tents or wooden houses. And no doubt the great Lop-nor highway ran directly through it, for the eastern and western gates lay exactly along the line it took. Indeed, old folk amongst the Lop-men still preserve a tradition that the great highway to Peking ran through Ying-pen, and so on to Dung-khan or Sa-chow.

Leaving these ruins, we steered east-south-east to Ying-pen, having on our right, though a long way off, a thick belt of fine poplars, marking the dry river-bed which it was the main purpose of our expedition to explore. The name given to that watercourse by all the native hunters who are acquainted with it is Kurruk-daria, or the "Dry River," though they also call it sometimes the Kum-daria, or "Sand River"; it was by this name that Kozloff knew it.

The *örtäng* or "hostel" of Ying-pen was a Chinese post-station, which at the time of our visit had stood empty and deserted for a whole year. The authorities had for some time past been endeavouring to revive the traffic on this the old route between Lop and Turfan, but without success; for the route *viâ* Korla is more comfortable as well as more convenient. Ying-pen was a true oasis in that it was surrounded by desert on every side; and during the two days' rest which we gave our animals there we had no fear of their running away. The place was frequented by wild-duck, wild-geese, and partridges; and fresh water was obtainable from a well. The post-station stood on a prominent terrace or platform, some six or seven feet high, immediately north of a salt marsh overgrown with reeds.

Geographically this was a point of the greatest possible interest, for it was soon apparent that the marsh in question lay in the elbow of an ancient river-bed, which had run between two belts of poplars, just as the Tarim does now. The fact was even patent to the natives themselves. But from this point eastwards the channel contained not a drop of moisture. All the way from Ying-pen, until it entered the desiccated basin

of the ancient lake of Lop-nor, it was as dry as tinder. On the 12th of March the temperature rose to 21°.4 C. or 70°.5 Fahr., and the flies and spiders began to show signs of reviving animation. It was a warning to us of the uncomfortable days to come, when we should be tormented by the intense heat and swarms of insects, and should enjoy coolness only in the night-time. These indications of summer suggested, however, that we might with advantage lighten our baggage. It was now time for Musa to return with all the horses—except my well-tried, gallant little grey—and one of the camels, which was not eating very well. I therefore seized the opportunity to

A Ruin near Ying-pen.

send back with him my furs and ulster, my winter boots, the stove, and other things we could do without. But as it turned out, it was a premature and ill-advised action.

On the 13th of March we were once more in motion; but during the march, the wind, which had set in the day before, increased to a perfect hurricane. We were travelling eastwards, keeping to the left-hand scarped edge of the dry river-bed, which was plainly marked all along by groups of poplars. One of the loops which the river made was as fresh as if it had been carved out only a year ago. It contained a crescent-shaped pool of salt water, entirely free of ice, just like the *boljemals*, or "abandoned loops," of the Tarim, and on its left side was

a group of poplars, some of which measured as much as 13½ feet in circumference at their base. This, however, was the last pool of water and the last patch of living forest we encountered along this dry and ancient watercourse, though we did find dead forests, the trees still standing on their own roots, like gravestones in a churchyard. The ground was covered with fine powdery sand, which whirled up and hung behind the caravan like a comet's tail. The men sat rocking on their camels wrapped in their chapans or cloaks. It was twilight as early in the day as two p.m., and as the storm still continued to increase, Abdu Rehim declared we must stop; it was killing work for the camels to struggle against the wind. Accordingly we halted, and set about seeking for a sheltered place in which to pitch camp. Just in this locality the clay desert showed peculiar modifications of relief, being carved by the wind into pyramids, and horizontal terraces, and flat benches or shelves, each rising, as a rule, six to seven feet above the general level of the surface. Branches of dead poplars lay scattered about in every direction.

Whilst seeking for a sheltered place to camp in, we nearly lost one another. I walked towards the south-west, or rather I was carried by the wind, and at such a rate that I did not observe how far I was being taken from the others. However, failing to discover a suitable site, I turned round to retrace my steps; and then it was I felt the full brunt of the tempest. For it drove right into my face with terrific violence, smothering me with sand and fine reddish-yellow powdery dust. I could not see a single glimpse of the caravan. It was like wading against running water or liquid mud, and despite my most desperate efforts, I was unable to make headway. My previous footprints were entirely obliterated—obscured the instant I lifted my foot. Eyes, mouth, nose—all were stopped up with sand and dust, and I was forced to stand still to catch my breath. Then I saw a spectre looming out of the haze, and discovered it was Chernoff coming to look for me.

As soon as we were able to get hold of the other men, we encamped just where we were. My tent was reared on the sheltered side of a tamarisk mound; but we did not dare put up more than the half-lengths of the side supports, and even then had to stay their upper ends together with ropes. The side-cords were wound round massive arms of the root, and heavy pieces of timber were laid across the folds of the canvas

A Sand-storm in the Desert.

which lay on the ground. When all was finished, the tent stood quite firm, and rode out the tempest successfully, though showers of fine sand penetrated through the canvas, and smothered everything in the interior.

Owing to the poles of the men's tent being in single pieces, they were unable to put it up at all, but lay on the ground, muffling up their heads in their cloaks. The camels knelt in a long row, with their necks stretched out flat on the ground in the direction in which the tempest was blowing. Close to the earth the wind had a velocity of 40½ miles an hour; but on the top of an adjacent mound, only six or seven feet high, it was some 18 miles an hour more, or 58½ miles in all, and I was only able to keep my balance when I knelt. The storm came from the north-east, and its violence enabled me to form some idea of the inconceivable quantities of sand and dust which are transported by this mighty agent towards the regions of the west and south-west. When we stooped down, we were well-nigh choked by the swirling cloud, which careered along the ground like a cataract, making little eddies of dust as it swept on. Branches, tufts of grass, grains of sand as big as peas were whirled into our faces with stinging force.

Just about dusk this black tempest seemed to tire a little; for the space of two or three minutes the sky lightened a shade, while the wind slackened and caught its breath as it were. This pause was very instructive; it showed how easy it was to be mistaken in our calculations of distance, both horizontal and vertical, when we were entirely swallowed up in a dense "sand-fog" such as this. For while we imagined ourselves to be encamped in a depression or valley, we discovered that the adjacent country was in point of fact almost flat.

But the pause was soon over. The tempest returned in full blast, and went whistling, howling and roaring past my canvas cave, within which I hastily burrowed out of the all-engulfing sand-fog. Cooking was of course absolutely out of the question. I had to content myself with bread and water and the contents of a pot of jam. I set to work to write up my diary by the light of a candle, but the ink dried in the pen owing to the shower of sand that fell over me, and the pen itself scraped and scratched as it moved through the little heaps of sand which gathered on the paper. Within half-an-hour every object that was exposed to the air had completely vanished from sight. To undress amid such a rain of searching sand was extremely dis-

agreeable, especially as my bed, too, was full of it. That stifling dust-laden atmosphere! It was enough to suffocate anybody and everybody.

Where, I wonder, did those millions of cubic miles of air come from, and where did they go to? What were the forces which started this torrential rush of air? Was it that the vast deserts of the western parts of Central Asia were already warmed so greatly in excess of those farther to the east, that the latter were called upon to fill the vacuum which was caused by the upward movement of the heated air? Or was all this stupendous pother nothing more than a merely local occurrence, a column of air pouring like an untamable flood down the sides of the Kurruk-tagh, and then returning again on the revolution of some imaginary wheel at higher altitudes, after simply brushing against the surface of the earth? It was not easy to tell; but this at any rate is certain, that it is the wind which is the most powerful physical agent in moulding the features of the earth's surface in those parts of the world.

The minimum temperature during the night of the 13th March was −7°.1 C. or 19°.2 Fahr.; and although on the following day the tempest abated very considerably, it still remained bitterly cold—so cold, indeed, that we were forced to make up a gigantic camp-fire, and afterwards travel a good long distance on foot to get warm. I had made a great mistake in sending back my furs and winter clothing.

The bed of the Kurruk-daria was still moist in two or three places south-east of our camp, and in those spots a few tamarisks and patches of reed still struggled for life; but the forest along its bank was dead, some of the trees lying prone, others still standing on their own roots. After that we came to some exceedingly difficult country, namely, a perfect labyrinth of clay "terraces," with sharp-cut edges, which the natives called *yardang*; and as this is a very graphic descriptive word, I shall for the future use it when speaking of these scarped formations. They were originally formed by the agency of running water, but have subsequently been resculptured by the wind into the most fantastic and capricious outlines imaginable. Hence it was not always easy to trace out the continuations of the river-bed which wound amongst them; and travelling amongst them was not only wearisome, but also terribly slow work, for we were all the time unceasingly climbing up them and then down again on the other side. These yardangs of the Kurruk-

The Onset of a Desert Storm.

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daria appeared to extend a long way towards the south; at all events they stretched as far as a couple of isolated sand-dunes which stood out above the dead level of the desert.

Farther on, we again passed two or three well-preserved river-bends, the bottoms of which were covered with coarse sand and gravel, the whole embosomed in dense woods, now dead. The tree-trunks which lay on the ground were as a rule more rugged than those which still stood upright; but then the latter were more exposed to the weather and the wind, as well as directly subject to the rasping, destructive effects of the drift-sand. These lifeless stems, standing like the embalmed mummies of ancient trees, gave the country the appearance of a stubble-field of Brobdingnagian dimensions. It was only alongside the dry bed of the Kurruk-daria that these dead forests existed; they had, of course, been once nourished by its fickle waters, and only died after the river changed its course and took a more southerly direction to the newly-formed lakes of Kara-buran and Kara-koshun.

The dry river-bed we were following wound along the foot of the extreme outliers and spurs of the Kurruk-tagh, and their lowest terrace—that is, the plain immediately to the south of them—afforded us a level and convenient road to march upon. One outstanding section of the mountains bore the curious name of Charchak-tagh, or the "Mountain of the Wearied Ones," the story being that a troop of Chinese soldiers who encamped there on their way from Turfan to the recently established post of Charkhlik discovered that their stock of provisions was at an end, so they flung away their weapons and other paraphernalia and returned to Turfan.

On our right we had the Kurruk-daria, and immediately on our left a parallel trench with a markedly scarped edge on the farther side. That is to say, we were travelling along a long narrow bank, as it were, between two river-beds, for the second trench, that on our left, was simply an older channel of the Kurruk-daria. This was evident enough even to Abdu Rehim, who knew that it continued for some distance towards the east. Sometimes the dead forests thinned out until their bare upstanding tree-trunks, when seen from a distance, acquired a remarkable likeness to telegraph-poles. We now observed for the first time traces of wild camels; they occurred in depressions sheltered from the wind.

Numerous *yiggdeh* bushes (*Elæagnus hortensis*) now appeared

in the dead forests. The natives of that region affirm, and quite truly, that these bushes afford the clearest proof of irrigation having been formerly practised in the localities where they survive, for of all trees and bushes they are invariably the first to succumb after irrigation ceases, and they wither as soon as the water turns salt. Tograk (poplar) and yulgun (tamarisk) are far more tenacious of life, and will continue to survive a long time upon their own roots.

On the 15th March there was again a strong east wind. Although it only blew at the rate of 15¾ miles an hour, still the cold (−1°.1 C., or 30°.0 Fahr., at seven a.m.) made us very sensitive to it, as it penetrated through our thin spring clothing. It was impossible to keep ourselves warm even when we walked half the time, for at one p.m. the thermometer only stood at 6°.8 C., or 44°.2 Fahr.; whereas at Ying-pen, with a west wind, it had recorded 21°.4 C., or 70°.5 Fahr. It is not inconceivable that these differences were in some way intimately connected with the varying degrees of calefaction or heating of the surface in different parts of the Asiatic continent. In the year 1897, just at this same season, I experienced stinging wintry cold with deep snow whilst travelling through Eastern Mongolia. Over the central parts of the desert region there was formed on the other hand a barometric depression, which acted like a suction-valve upon the colder regions all around. Now this inequality of atmospheric pressure is greatest in spring; but, as the summer advances, it gradually tends to disappear. It is owing to these causes that the Lop country is visited in spring by such furious tempests from the east and north-east.

We now left the Kurruk-daria, and directed our march towards the foot-hills of the Kurruk-tagh, in quest of a spring which Abdu Rehim knew of, and which we were anxious to reach. We were still separated from Yardang-bulak by a crest, built up of coarse crystalline rock and intersected by veins of diabase, the whole greatly weathered; but after crossing over yet another belt of barren country, we encamped in the little glen where the spring was situated. Here, on a very limited area, there was a luxuriant growth of reeds; and as this was one of the only two localities where pasture and water were to be met with, we decided to let the animals have two or three days' rest. In the same immediate neighbourhood were three other similar springs, though no vegetation worth speaking of anywhere near them. Our spring was called Achik,

or the Bitter; the others, Yukarki, Tömönki, and Yakka, or the Upper, the Lower, and the Outermost respectively. The water of Achik-Yardang-bulak trickled forth in a natural channel between low elevations, but was covered with ice, three or four inches thick. Thus we had to thaw the ice before we were able to use it; but when it was thawed, the water was excellent, and entirely free from any disagreeable mineral flavour, although the areometer, when placed in the very throat of the spring, showed that the specific gravity of the bubbling water was 1.012.

Our guide, Abdu Rehim, was a mighty camel-slayer, and

Wild Camel Shot by Chernoff.

utilised his first rest-day to go a-hunting. When he came back, after an absence of fourteen hours, he said he had found a big he-camel at Tömönki-Yardang-bulak, and had wounded him severely, though the animal crossed the Kurruk-daria, and finally escaped amongst the sand-dunes. Abdu Rehim declared that when a wild camel is wounded it always makes for the open desert, and he also believed that when, in the natural course of things, these creatures feel the approach of death, they go in amongst the dunes to die. His reason for this belief was, that he had seldom or never come across a skeleton of the wild camel amongst the mountains of the Kurruk-tagh. Maybe their instinct tells them, that in case they have to make

a long fight against death, they are more likely to be left in undisturbed peace in the desert than they would be amongst the mountains. Abdu Rehim reported further, that he had also observed fresh signs of a herd of seven wild camels, an old male, two females, and four *tailaks*, or young ones, which had been down to the "lower" spring to drink on the previous afternoon, and had possibly fled at our approach.

Chernoff was more fortunate. Very early in the morning I heard him speaking in an animated voice, but with extreme caution, bidding someone tie up the dogs. Then there was a dead silence, and then came five shots in quick succession, quite close to camp. A camel had come down the wind towards the spring without suspecting any danger. Chernoff and Khodai Kullu fired at him, but they only wounded him slightly, and he turned and fled back to the east. The Cossack followed him, and every now and again the animal stopped and regarded his pursuer with a certain amount of curiosity. Chernoff shot at him again at 500 paces' distance, and the shot struck him in the shoulder. The camel then went off at a slow run towards the south, fell two or three times, got up again, and finally fell for the last time about one mile and a quarter from camp.

It turned out to be a young she-camel, and her coat was covered with the finest and softest hair imaginable; and as this was the season when the wild camel sheds its coat, her hair came off almost of itself. The men gathered what there was of it for making into cords and ropes. After that they cut the camel up; and the meat was very welcome, for our supply of mutton, which, during the last few days, had been tasting very strong, was now quite at an end. Abdu Rehim asserted that the wild camel always shuns for a long time the locality in which one of its own species has been killed.

In the evening Chernoff shot a fine brace of partridges, which also proved very acceptable. During the hot weather, it was always a difficult problem in Central Asia how to supply ourselves with fresh meat. I had arranged with Kirgui Pavan and a couple of other hunters, who knew Yardang-bulak, to meet us there with five sheep, besides poultry and eggs. But we heard nothing of them, and could not afford to wait any longer. After we got back, we learned that they started all right, but lost their way in the desert, and during the storm three of the sheep also went astray. When they at length reached Yardang-bulak, the rest of the sheep were half-dead

with fatigue, and as the men saw from our camp-fires that we had been and gone, they turned round and went back to Tikkenlik. However, their non-arrival was not a matter of any consequence, for, once we reached Kara-Koshun, we should be, relatively speaking, in the land of plenty.

CHAPTER XXII.

THE WILD CAMEL.

ABDU REHIM gave me a good deal of information about the habits and peculiarities of the wild camel, which agreed well with what I learnt in 1896 from the old camel-hunter on the Lower Keriya-daria. At the spring season the wild camel requires to drink once a week, though in the winter he can go a whole fortnight without. He can even go half a month without water in summer, provided he can get grazing with plenty of sap in it. The reason he cannot do without it for a longer period in winter is the dry nature of the food he eats at that season. The wild camel knows his way to the nearest springs as unerringly as though he guided his footsteps by map and compass. He will even drink water that has a decidedly salty flavour, and seems to like it. When there is a strong wind blowing, a hunter may approach within 30 paces of him, if he happens to be amongst tamarisks or kamish, or indeed if he is grazing anywhere where the hunter can conceal himself. As a rule he is not shot at when the distance exceeds 50 yards.

The wild camel's keenest sense is that of smell. Abdu Rehim asserted that he could scent a man at Yardang-bulak all the way from Oy-köuruk, a distance of 13 miles. The moment his suspicion is aroused, he takes to flight with the speed of the wind. The wild camel of the Kurruk region resembles his congener of the Keriya-daria, in his unspeakable horror of the smoke from a camp fire, and in the fact that he shuns every place that human beings visit, however seldom. And he has just as great a repugnance to the tame camel when the latter carries a pack-saddle; indeed even after the pack-saddle is taken off he recognises the tame camel by the unfamiliarity of his scent. On the other hand a young camel, not yet broken to work, had once or twice run away from Abdu Rehim's father, Ahmed of

Singher, and gone and joined itself to a herd of wild camels, and been received by them without hostility. On one such occasion Abdu Rehim's brother shot one of his father's own camels, thinking it was a wild one. Here I may mention that, according to Przhevalsky, the wild camel was common in the desert of Kum-tagh, to the east of the marsh of Kara-koshun. At the present time he is never seen there, or very rarely indeed; which may be owing to the desiccation of the lake, or is, perhaps, due to the fact that the pools of water which still survive in that quarter are situated too near to inhabited regions.

The wild camel will not approach the spot where a hunter has once encamped until after a very long interval of time has elapsed. As a rule, wild camels only remain two or three days at a time at each grazing-ground, and then move on to another. They only visit the springs to drink; they never stop there to graze, no matter how tempting the pasture. My informant persisted that the wild camel's instinct tells him it is at the springs he runs the greatest risk of being molested by man. As soon as it gets dark he lies down beside a tamarisk, where the ground is soft, and does not move again until the sun rises. He eats all sorts of green stuff, though his favourite provender is clumps of withered grass, which, having been separated from its roots, has been blown together by the wind. Hence he is fond of frequenting localities where the ground and the winds favour the accumulation of this tussock hay. He also displays a marvellous sureness of instinct in finding his grazing-grounds, travelling in a straight line from the one to the other, even when they are several days' distance apart, and even though there happen to be no prominent features in the landscape to guide him.

In the breeding season, that is to say, the months of December, January, and February, the males fight fiercely whenever they encounter one another, equally whether on their grazing-grounds, at the springs, or in the desert. The animal which is vanquished is often driven away by himself, while the victor will be followed by as many as eight she-camels. If two fairly well-matched males come into conflict, they do not stop fighting until one or both of them is put *hors-de-combat*. They mangle one another terribly with their teeth, and very often tear large pieces of flesh out of one another; in fact you seldom find a full-grown he-camel which is not disfigured by some nasty scar or other.

The wild camel is frequently seen quite solitary by himself, often also in pairs; but the general rule is for a troop of four to six individuals to associate together. Troops of 12 to 15 are extremely rare. The leader of a troop is always a big he-camel. The period of gestation in the case of the tame camel is one year; in the case of the wild camel it is reputed to be fourteen months. It is estimated that a tame she-camel can bear one young once every eighteen months, beginning with her third year and ceasing with her fifteenth. The young suckle forty days before eating grass, but even then still continue to suckle for more than a year. In fact the little creature can barely reach the ground with its muzzle until it is fully one and a half months old. These things are apparently true also of the wild camel.

The tame camel can be worked until it is twenty years old. The wild camel is said to live for fifty years; but this is more than doubtful, it is unlikely. Abdu Rehim, however, once found embedded in the rib muscles of an old he-camel a Mongol rifle bullet, which, from its shape, must have been at least forty or fifty years old, for it was something like that period of time since the Mongols had used bullets of that particular shape. According to his account the camels of the mountainous districts are more difficult to kill than the camels of the Takla-makan. Chernoff suggested that that is because the hunters in the mountainous districts use less effective charges of powder, and carry less perfect weapons. The consequence is the bullet does not penetrate sufficiently, and often stops without touching a vital organ, so that the animal escapes without suffering any real injury.

The wild camel is found everywhere between Yardang-bulak and the district of Khami; but he never goes west of the caravan-route from Ying-pen to Turfan. Our Camp no. VII. (13th March) may be regarded as his most westerly point in the bed of the Kurruk-daria. In the Kurruk-tagh he frequents principally the neighbourhood of Altimish-bulak, and to the east of it. He is, however, a restless creature, and leads a nomad existence over a wide range of country. A year subsequent to this I obtained further data for determining the range of his distribution.

Abdu Rehim had been a camel-hunter for six years, and during that period had shot fifteen camels, which shows that they are not an altogether easy game to bag. On one occasion

his father tried to capture a young one, and rear it and tame it. But the moment the little thing was born its mother, having grown suspicious, caught it up between her chin and neck, and fled with it in such haste that it was impossible to overtake her.

Before I part with Abdu Rehim, I must say a word or two about his family relations. He was the son of Ahmed Pavan, who had dwelt forty years at Singher, and had had four sons born to him there, of whom three were married. That is as much as to say, all the inhabitants of the little village were members of Ahmed's family. The eldest son was the *karaulchi* or "station-keeper" in the village, and was appointed to the office by the amban of Dural. It was his duty to report anything that happened within his district in violation of the law, or indeed anything that was in any sense noteworthy. The father, Ahmed, was a native of Turfan, and owned some 200 sheep, which he placed under the care of a Mongol shepherd in the district of Asghan, the arrangement being that the lambs born every year were divided equally between the two, while Ahmed received as much of the wool as was required to weave three *kighiz* or thick felt rugs. And the Mongol shepherd himself owned large flocks of sheep.

Besides sheep, Ahmed possessed a troop of 27 camels, and trafficked in the animals, buying when they were cheap and selling, of course, when they were dear; also two horses and ten cows. At Singher he grew wheat, maize, melons, onions, and other vegetables, the soil being exceptionally fertile, so that he was able to count upon a return every year, whereas, in other districts, the people are some years obliged to leave the ground fallow He obtained his water for irrigation purposes from the spring-fed rivulet of Singherlik, which is about as big as the brook of Sughett-bulak. Ahmed and his family were passionately devoted to Singher, and would not exchange it for any other place in the world.

Abdu Rehim was a strong, handsome young fellow, cheerful of disposition, and very trustworthy; but what I valued most about him was his truthfulness, and the reliability of his information. When he was unable to answer a question I put to him he used to say he did not know. The usual practice of the Central Asian Mussulman in such cases is to invent some sort of an answer on the spur of the moment. Abdu Rehim managed his eight camels with admirable skill, attended to everything,

helped to load up and unload like a slave, and found his way from spring to spring like a wild camel. He was as strong and agile as a tiger, and to see him swing himself up on the back of his riding camel with his heavy and clumsy-looking rifle slung over his shoulder was quite a treat. I generally summoned him every evening to my tent, and pumped him about his experiences. I tried to induce him to travel with me, but he was too anxious to get back to his home amongst the mountains.

When we started on the 18th March we took with us seven goatskins and two sacks all filled with ice, as well as two sacks stuffed with kamish, which we proposed to dole out to our camels when we came to the next desolate camping-ground. However, for the first night we decided to halt at Yakka Yardang-bulak, which was close at hand, so as to get what advantage we could from its kamish grazing.

All at once the advance guard halted, and Abdu Rehim slid down off his camel, and began to creep along the ground, with his rifle on his back. I stole up to him, and then through my field-glass saw a troop of wild camels, consisting of a big black *bughra* (male) and five other individuals of a lighter colour. The black one had just got up, and was stretching his head in every direction, sniffing the wind with keen suspicion. Three of the others lay and chewed their cud, while the other two were grazing. I and the hunters—for Chernoff and Khodai Kullu had also joined in the stalk—concealed ourselves in a favourable place about half a mile distant, whence we were able to follow every movement of the troop without being seen ourselves. Meanwhile Abdu Rehim stole along the yar terraces, whither the trail also led Chernoff. But the wind blew from us towards the camels, and the big he-camel plainly suspected something was wrong. He moved to where the she-camels were lying, stopped, sniffed and sniffed, keeping his head turned all the time towards us, and then went on a little further. Meanwhile the other camels, two full-grown females and three colts of a year old, noticed nothing amiss.

A shot echoed; but it failed to reach its mark. The distance was too great. The bughra, however, alarmed by the report, set off in rapid flight. For one instant the she-camels hesitated, then they leapt up like a shot, and went off at full gallop, skimming up the dust behind them. The big male ran by himself, the others all in a cluster about a hundred paces to his right. I followed them with my field-glass, and saw how within a very

few minutes they dwindled to tiny black dots, and after that the rising dust alone revealed which way they had fled. They travelled at a great rate and without once stopping, for they had got scent of the caravan, and fully realised the nature of their danger. At first they directed their flight towards the south-west, but gradually veered round in a semicircle to the south and the south-east. Abdu Rehim thought they would in all probability make eventually for Altimish-bulak.

At Yakka-Yardang-bulak the ground was trampled in every direction by wild camels, the little kamish oasis being evidently one of their chief feeding-grounds and stopping-stations in that part of the desert.

Next morning we had travelled but a short distance when our sportsmen stopped again and pointed towards the south. There we perceived a solitary camel meditating amongst the dead tamarisks. Three rifles were at once levelled at him; three shots echoed. But the distance was too great, and the beast trotted leisurely off towards the north-east. That is to say, he ran across our line of march, and thus came over on our left hand, after which he stopped short, and observed the disturbers of his peace. Chernoff had another shot at him, and wounded him, though only slightly, and although he pursued him on horseback, the camel managed to escape into the mountains. He was clearly one of those solitary males which had been vanquished by some stronger rival.

All this while we had the lower terrace of the Kurruk-tagh on our left hand; it was seamed by innumerable rivulets and ravines, all made by rain-water. On the right was the winding Kurruk-daria, with its dead forest and its yar terraces, its bed being 246 feet broad and 12 to 16 feet deep. From this point onwards the ground was littered with enormous quantities of snail shells (*Limnæa*); you could gather them up in basketsful; which goes to show that the river was formerly accompanied by marginal lakes. The matter admitted of no doubt whatever, for freshwater molluscs do not frequent swift running water, only tranquil lakes and lagoons where there is an abundance of vegetation.

Shortly after this we crossed the river-bed, and directed our steps towards the south-east, so as to get some idea of what the desert was like in that direction. The ground at the foot of the mountains was very granulated and difficult to travel on. The yardangs were, it is true, lower, and the watercourses not more

than a foot or so deep; still there were so many of them, that the camels did nothing but stumble.

On the 20th of March we were favoured with exceptionally bright, fine weather. The continuous ridge of the Kurruk-tagh was plainly visible; and it steadily increased in height as we advanced east. As far as we were able to see, the country in that direction still continued to present the same characteristics; but in consequence of the mirage the lower flanks of the mountains appeared to be lifted a little above their true level.

We often lost sight of the old river-bed for hours together; then we would strike it at some bend or other. In all probability the existing relief is the result of several hydrographical epochs. The extraordinary sharp-cut terrace which runs along the foot of the lowest sai is in reality the shore of what was some time or other a large lake, which subsequently gradually contracted in area. The snail shells that remain indicate the extent to which the country was formerly under water. In proportion as the western shore of the lake travelled back towards the east, so did the river-mouth advance with it, flowing as it went through smaller lakes and basins, exactly as the Lower Tarim does at the present time; as we shall indeed see lower down. This explains why the old river-bed was distinctly traceable for short distances only.

As we advanced, the desert became more and more barren. We frequently crossed wild camels' tracks going towards the south. It is not at all unlikely that wild camels do visit the Avullu-köll, although the Lop-men seldom visit it themselves. Presently we were once more travelling along a portion of the river-bed, which was remarkably distinct. Here it was 308 feet broad, 21¼ feet deep, and still had dead forest on its banks. In other words, it was a "fossil" river. If you were to cut off a section of the Tarim and let its water flow away, and its forest wither and dry up, you would have precisely the same effect as in the river we were now following beside the Kurruk-tagh.

The aspect of the country changed but little. The mountains resembled a chain of low hills, with a scolloped crest. Dead forest grew less frequent, and trees that still stood upright rarer than ever. On our right was a "sea" of yardangs, strewn with myriads of snail shells. Ördek discovered an earthenware jar, a fragment of a large dish with glazed arabesque ornamentation, and a piece of a huge copper pot, with its edge turned horizon-

Cakes of Ice at the Oasis of Altimish-bulak.

tally downwards. The dish was of Chinese make. It was clear there had once been a dwelling or a settlement here ; at any rate the vicinity had plainly been inhabited at some time or other.

At length the bed of the Kurruk-daria came finally to an end, and we entered upon a tract of country which was formerly covered by the ancient lake of Lop-nor. The forest, of course, came to an end as well, but the snail shells were still more numerous than heretofore. The yardangs consisted now of ridges, five or six feet broad, and about three feet high; built up of tolerably firm, yellow clay, disposed horizontally, and following one another to infinity in a north-east and south-west direction ; and between them were an equal number of parallel trenches or hollows, of the same depth and the same breadth. The geographical disposition of this peculiar formation suggested that it was exclusively caused by the prevailing north-east wind, which uses the drift-sand as a file against the easily sculptured clay ; and the suggestion was confirmed by the surfaces of these long " benches " all showing unmistakable evidences of having been scoured or polished by the wind. There were of course no accumulations of drift-sand, owing to the quite recent date at which the lake disappeared. The exaggeration in Marco Polo's statement, that a man would require a year to cross the desert of Lop, is not so very great after all, when you bear in mind that in his day the lakes of Kara-buran and Kara-koshun did not exist, and consequently one unbroken desert might very well stretch all the way from Takla-makan to Manchuria.

At Camp no. XII. there were dead togràks still standing on their own roots—a little grove which had formerly existed on the northern shore of Lop-nor.

Not far from this camp we discovered some thick potsherds of a bluish grey colour, which had belonged to a large earthenware vessel with small ears. This made the third time we came across evidences of human beings amongst these dried-up waterways. The ground was covered in places with deposits of salt, pointing to the lake having become gradually saline as its water left it. Were it not for the wind planing off the surface, these deposits would no doubt be more numerous than they actually are.

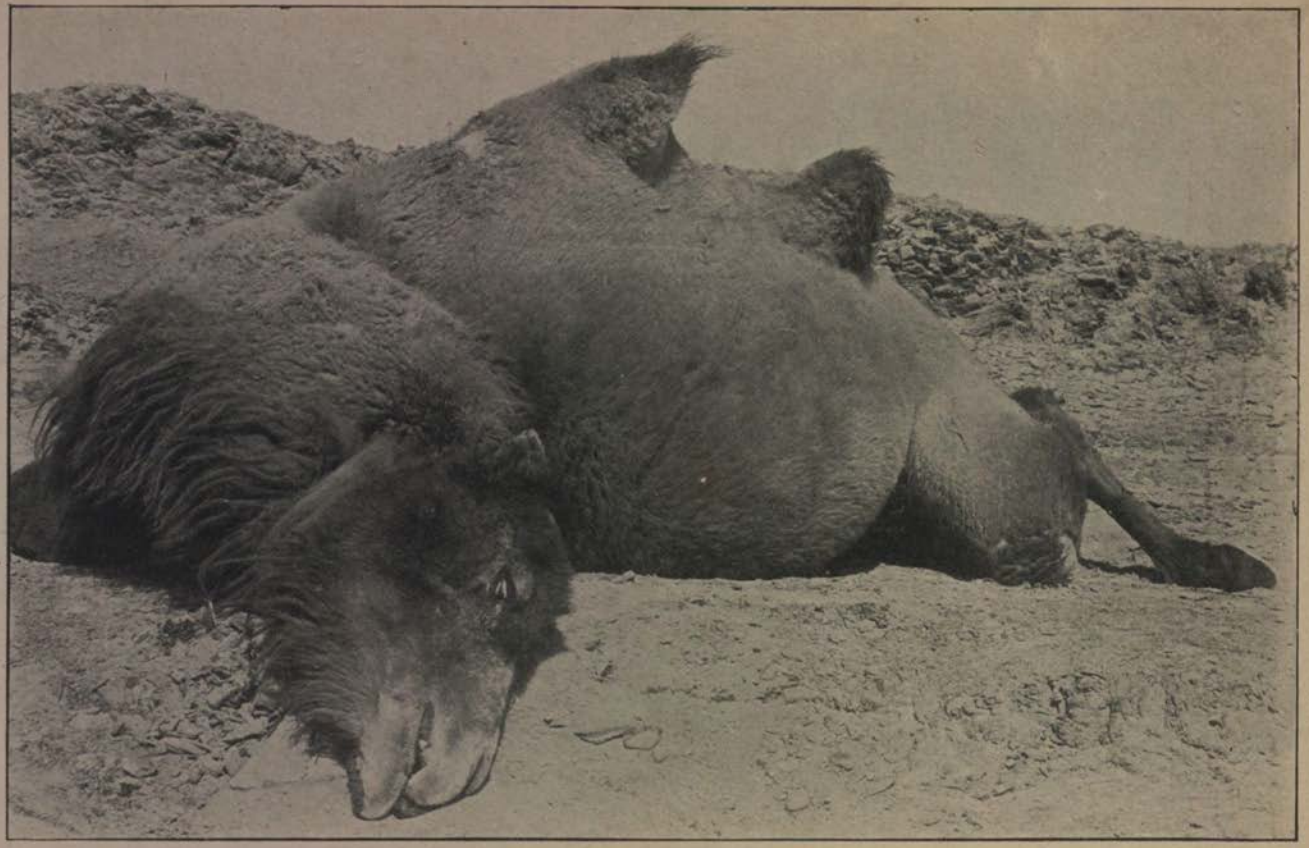
Our next object was to discover Altimish-bulak, or the " Sixty Springs." Accordingly we directed our course towards the north-north-east, and in so doing ascended the extreme outlying spurs of the Kurruk-tagh, and of course left behind us

the absolutely level, but locally irregular, surface of the desert. Towards evening a strong gale sprang up from the north, and the sky became thickly overcast, so that it grew dark early, before we were able to strike the springs. Hence after going 23½ miles, we came to a halt in a perfectly barren clay desert. This made the fifth day on which we had failed to reach water, and the little we had left in the goat-skins was polluted. As our supply of meat was also exhausted, we all got very short commons that evening. Next morning the wind was still blowing at the rate of 24½ miles an hour. When I stepped outside of my tent at daybreak, it was a very dreary scene my eyes rested upon—a low ridge stretching towards the north-east; south-east the contour falling away towards the "ocean of sand," with insignificant crests and long chains of low hills in the far, far distance; the earth everywhere covered with gravel, not a plant to be seen; everything weather-worn, cheerless, desolate! So insignificant were the distant chains of hills, that the Chinese have not even entered them upon their maps; the only thing they have depicted is the main range a long, long way to the north.

This day we were guided by Melik Ahun, Abdu Rehim's brother. And well did he pilot us, for immediately after passing an eminence, we became aware of an open expanse ahead, with a yellow patch in the middle of it. It was the splendid oasis of Altimish-bulak, and oh, how welcome a sight it was!

Abdu Rehim and his brother, their eyesight quickened by their open-air hunter's life, at once perceived a troop of wild camels grazing on the eastern edge of the oasis—but I, even with my field-glass to help me, was scarce able to distinguish the creatures. Directing that the caravan should make a detour and so keep behind a low ridge, the experienced camel-hunter, accompanied by Chernoff, hurried on towards the reed-beds of the oasis. I, too, followed them, intending to watch the issue of the stalk. Crossing the little rivulet, which drained the Sixty Springs, and which, as our guide had quite correctly foretold a month before, was covered with big cakes of splendid ice, we crept in amongst the reeds and tamarisks. The borders of the little oasis terminated quite abruptly, and we crossed over the greater part of it before Abdu Rehim stopped behind a couple of tamarisk mounds.

The troop we were stalking consisted, like the last one, of a big dark-coloured bughra and five other camels of a lighter skin.



A Wild Camel Shot at Altimish-bulak.

Perhaps they were the same we had seen at Yakka-Yardang-bulak. The old male and one of the others were busy grazing; the rest lay with their heads turned in our direction, that is, away from the wind. We were now within 300 paces of them, and the wind blew straight from them towards us, so that neither by scent nor hearing were they able to get any warning of our approach. We, of course, used the utmost precautions not to be seen. I could not help feeling how cowardly it was to creep thus stealthily upon these noble beasts, and attack them from an ambush.

I was most interested to observe as much as possible of their movements and habits in the state of nature; but I could not forbid the men to shoot them, for it would have caused discontent, and given dire offence in the caravan, and ultimately might have led to unpleasant consequences. Besides, camel-hunting was Abdu Rehim's calling. Mussulmans possess not an atom of sympathy for the feelings of the animal creation, and if I had forbidden the men to shoot the camels, they would have set it down as an act of malice against themselves. An occasion like this was, too, a solemn moment for a hunter, as I could easily see from the bearing of my men. Their eyes glowed with excitement, and they neither heard nor saw anything except the game they were stalking. But I always drew a sigh of relief when they missed. I confess my sympathies were with the camels, not with the hunters.

Bidding us wait where we were, Abdu Rehim made a long detour with the object of getting past a gap in the reeds without being seen. And then he disappeared in the bushes as silently as a panther; we neither saw nor heard which way he went. Meanwhile I made the best of the opportunity to study the camels' movements. The two which were grazing kept their heads to the ground, but lifted them occasionally when their mouths were full, and masticated slowly and with great power of jaw, so that the dry kamish rustled between their teeth, while their glances scanned the horizon. They did not, however, betray the least sign of uneasiness, and evidently never suspected what was about to happen.

Crack! went Abdu Rehim's rifle, and five of the camels came at a slow trot towards the bushes in which we were hiding. Then, thinking danger might lurk there, they suddenly wheeled about and went off up the mountains at a gallop.

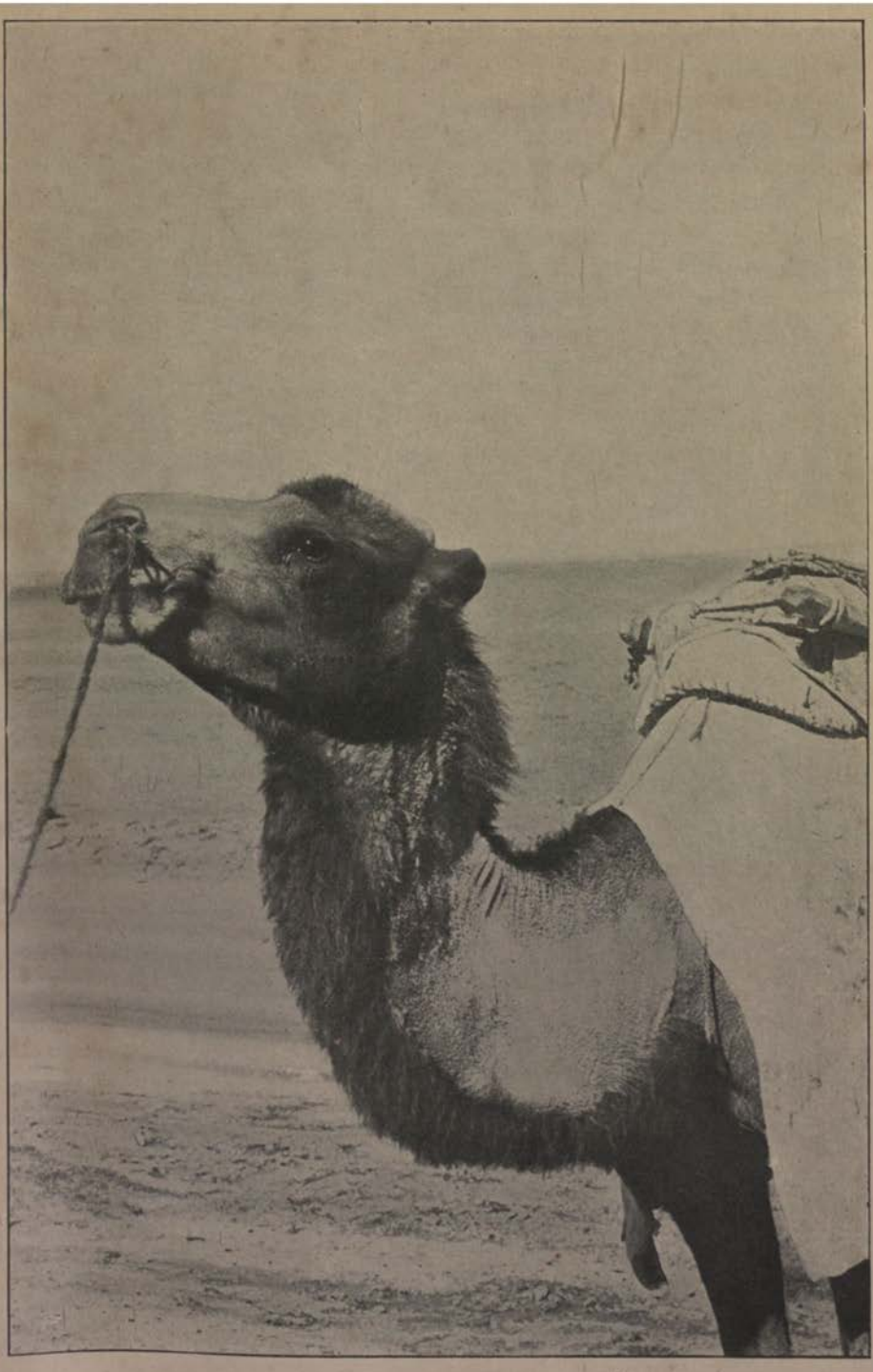
It was the younger of the two camels that were grazing which

fell. He had got a ball in the abdomen; a second struck him in the neck when he tried to rise and go after his companions.

When we came up to him, he was resting on all four knees, and chewing the reeds he still had in his mouth. He raised himself upon his hind legs, but his fore legs refused to support him, and he fell over on his side. His expression was that of calmness and resignation, without any trace of surprise or fear, and the only attempt he made to bite was when we stroked

Head of the Wild Camel Shot at Altimish-bulak.

his nose. He bore a remarkable likeness to the tame camels from Singher, and had just begun to lose his hair. After I had photographed him from various positions, Abdu Rehim, with one powerful sweep of his knife, cut his throat, the blood gushing out in a torrent. A few convulsions, and this son of the desert, who only a few minutes ago was grazing so peacefully and securely amongst the reed-beds round the spring, passed to the pasture-grounds of eternity. The other wild camels were long ago out of sight. Abdu Rehim was quite delighted at the prospect of having such a pleasant surprise to give to his old father as a large supply of camel-meat.



A Tame Camel, which Participated in my Journeys of 1896 and died in Tibet 1901.

The dead camel was a male, four years old. The appearance of his front teeth furnished, as they do in the case of the tame camel, a pretty safe indication of age. His presence in a troop which was led by a bughra was explained by the fact of his having an ugly bite in the neck and by his still tender age. Two or three months before he met his death he had had an encounter with a hunter, for we found a bullet under his anterior hump, and a clot of black coagulated blood hanging in his hair showed where it had penetrated.

We kept our Singher camels tethered at night, and had them watched during the day, otherwise they would have gone off and made their way back to Singher. For their sense of locality is very highly developed, and they are capable of finding their way home from a totally unknown district fully a month's journey away. Abdu Rehim declared it was his camels which led us straight towards the spring of Altimish-bulak the dark night we encamped in the stony desert, and had I not commanded a halt, they would have gone on until they actually reached the spring.

The number of wild camels along the foot of the Kurruk-tagh varies a good deal in different years, according to whether they are most pressed by the hunters there or in the district of Lukchin. The year of our visit they were plentiful in the Kurruk-tagh region.

CHAPTER XXIII.

THE ANCIENT LAKE OF LOP-NOR.

We pitched our tents among the tamarisks and reeds close to the spring. After our long tramp through the desert the place wore a most inviting and attractive aspect, and it was quite a pleasure to see how the camels and horses revelled in the luxuriant pasture, and kept returning again and again to nibble at the ice-cakes. But as we had another desert tramp before us we thought it well to let them have a few days here to pick up their strength. Unfortunately we ourselves were short of provisions. It is true we had a superabundance of rice and bread, but bread and rice alone, without anything else, get decidedly monotonous. The Mussulmans enjoyed the camel-flesh, but neither I nor Chernoff could prevail upon ourselves to eat it. Two or three flocks of wild-duck passed overhead, but did not settle at our spring.

The men from Singher were getting very anxious to set out for home, but I succeeded in making the following arrangement with them. Melik and his younger brother were to remain at Altimish-bulak with four of the camels, whilst Abdu Rehim and the other four camels accompanied me two days' journey to the south, to help our camels with their loads and carry sacks of ice. Further I could not induce him to go; he had a horror of the desert, although he had never penetrated into it.

We remained at this oasis, the most beautiful I have ever visited, from the 23rd to the 27th March. Indeed, after our forced march from Yardang-bulak rest was imperative. Although the atmosphere was greatly disturbed, it occasioned me but little inconvenience. My tent was so hemmed in by a dense belt of kamish and tamarisks, that the wind might howl and whine as it liked outside, I hardly knew anything of it in my snug little shelter.

I spent my holiday in taking a series of astronomical observa-

tions and in reading. The air was beginning to have a touch of spring in it. On the 25th of March the thermometer registered 17°.2 C. or 63°.0 Fahr. at noon, although during the preceding night it had been as low as −7°.1 C. or 19°.2 Fahr. Abdu Rehim gave me a good deal of geographical information about the region we were in, including the names of a great number of springs and their respective situations. A year later I had occasion to test the accuracy of his information, and found it quite reliable. To the east of Altimish-bulak he said he only knew of three springs, none of them named, and all within two short days' journey; he had discovered them whilst pursuing a wounded camel. Subsequently I found them all three, and, as it turned out, just at a critical time. He also described to me all the old routes he was acquainted with in the Kurruk-tagh, and told me they were marked by cairns of stones which he called *ova*, obviously the Mongol word *obo*. One of these ancient routes led to the south-south-west through Singher, and was probably identical with the route which the Chinese tax-collectors used to follow when they visited the Lop-nor country.

After completing our preparations, which included the collecting of a large supply of ice, packed in four *tagars* (bags) made of kamish, we started again on the morning of the 27th. It was my intention to cross the desert of Lop from north to south, so as to obtain a clear idea of the extent of the ancient lake, as well as incontrovertible proof of the existence of the lake basin. Our recent march along the bed of the Kurruk-daria, and the fact that it did eventually issue into a lake, had proved not only the accuracy of the Chinese maps, but also the correctness of Von Richthofen's and my own views with regard to this disputed question. It only remained to get a sketch of the contour-lines of the region which the lake formerly covered.

The desert journey which lay immediately before us was not likely to be attended with any danger. The distance to Kara-koshun, where we should find game, and, further to the west, Lop fishermen, could be traversed in a week, so that even though the supply of water we were taking with us should prove insufficient, we were not likely to perish from thirst. We crammed the *tagars* with clear ice, and although we afforded them the best protection we could against the sun, we lost fully a couple of bucketsful during the first day or two of the march.

Soon after starting we saw a flock of wild-duck settle in a little rivulet which came out of a glen on our left. Chernoff stole

upon them with his double-barrelled gun, and managed to bag five. They were fat and tender, and made a most welcome addition to our scantily-furnished larder. The birds came from Kara-koshun, because, as Ördek and Abdu Rehim explained, that lake was so densely thronged with them, the late-comers were obliged to turn back and go to Bagrash-köll, which they did *viâ* Altimish-bulak and Singher.

We did 18½ miles that day, and emerged from the mountains into the uniform desert, where the clay formations were deposited at three different levels. The lowest level was the bottom of the watercourse we were following. The middle level, which covered half the entire area of the desert, was the ordinary yardang, some 6 to 8 feet higher. And the third level consisted of small plateaus, towers, and pyramids of red clay, reaching 50 to 60 feet above the ground; these were most numerous on the east side of the route we were pursuing. These peculiar features were arranged in long rows, and bore such a remarkably close resemblance to the ruins of fortified walls, that two or three times it was only an examination at close quarters which convinced us they really were not such. It is worth recording that the trenches which lay between the flat yardang ridges ran exactly parallel to the bayirs in the Desert of Cherchen. In both cases alike the depressions owed their existence to the action of the prevailing winds.

The Kurruk-tagh had no definite continuation towards the east. At the most there was merely an isolated mountain group. Thus I already saw reason to doubt the existence of the large range which is shown on our maps as running in that direction through the heart of Asia, and my investigations a year later established the fact that it really is an insignificant chain.

The desert was absolutely barren; there was not even so much as a decayed tree. Occasionally we came across snail shells, but they were nothing like so plentiful as they were further west.

On the 28th we travelled 13½ miles, going to the south-west. During the course of the day the lake-basin assumed a different aspect. The snail shells became more numerous, and amongst them were thin patches of sand not exceeding a foot in thickness, and dead forest again made its appearance at pretty frequent intervals. There were now only two levels in the clay deposits, indicating different periods and different water-levels of the former lake. As the wind eats its way into

the clay, the snail shells drop lower and lower, until the ground becomes in places quite white with them. We picked up a small iron cup, and fragments of clay pottery were so common that we ceased to pay any heed to them. A belt of dead forest, which stretched in two directions, 60° east of south and 60° west of south, marked an important piece of the ancient shore-line of Lop-nor, showing as it did that the lake long remained stationary there.

Thus on we went between the ridges of clay, with the water drip—dripping in an alarming manner from our *tagars* of ice. About three o'clock in the afternoon Ördek and Chernoff, who were leading the way on foot, seeking out the easiest path to

Ruins of a House in the Desert.

travel by, suddenly stopped and shouted back that they had come to the ruins of two or three houses. The watercourse we were following had brought us straight to this remarkable discovery. Had we been travelling two or three hundred yards either to the east or to the west we should never have seen them. Indeed, so close was the resemblance which they bore to the ordinary dead forest that it was only a near inspection which revealed what they actually were, namely, human dwellings on the northern shore of Lop-nor.

We of course stopped and encamped at once, and I began a hurried survey of the locality. There had originally been three houses, but their immense beams and posts, their roof and boarden

walls, had all fallen in ; the timber was greatly decayed through time and the effects of the desert storms, and was moreover partly buried in sand. The only portion of the structures which still remained in position were the beams of the basement, and from these I was easily able to draw up a plan of the houses and measure their dimensions.

There was one circumstance which pointed to their being of some antiquity, namely, the fact that they stood upon mounds or ridges of clay, $8\frac{1}{4}$ feet high, which had precisely the same outline and area as the plan of the house. Originally the houses were no doubt built upon the level ground, but after the surface dried it had been scooped out and blown away by the wind, leaving behind only those portions on which the house actually stood. Round about these buildings were a great number of earthenware vessels, and small cups, such as are wont to be placed in front of the images of Buddha and in other parts of the Buddhist temples. We also picked up some iron axes, as well as two or three Chinese coins.

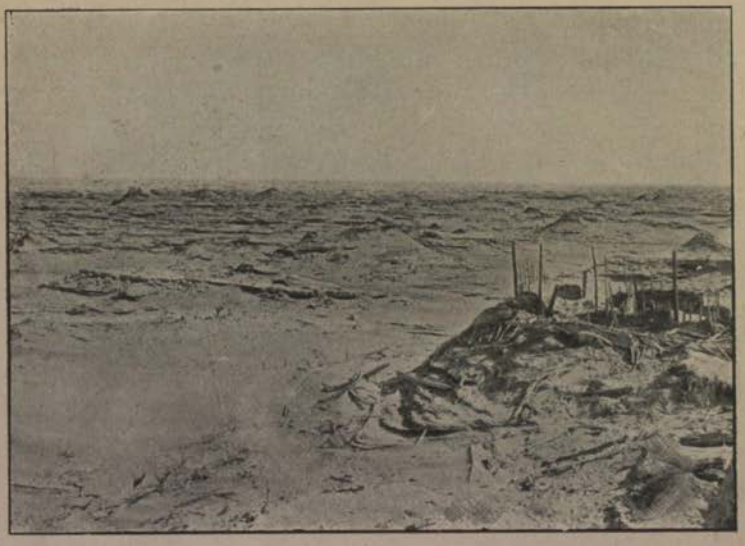
Upon excavating the easternmost of the three houses, we brought to light some remarkable wood-carvings which had been used to decorate the walls. There were the picture of a soldier, with a helmet on his head and a trident in his hand, and another man with a chaplet. The other designs consisted of pattern devices and scroll-work, lattice-work, and lotus-flowers, all cut with artistic sense, but sadly injured by time. I selected specimens of the different patterns to take with me.

There was also another tora or clay tower standing 58° east of south from where we were. That also I visited in company with Chernoff and Abdu Rehim, to see if by any chance there were any discoveries to be made there. The mound was cupola-shaped, and part of it had fallen down ; it had probably served as a roadway sign-post or as a signal-mound. This tora, together with three others like it, standing at distances of three to four miles apart, made a figure disposed in the same way as the four principal stars are in the constellation of the Lion. But we failed to find any further remains of ancient houses. It was already dark when we wended our way back to our big camp-fire, and by the time we at length reached it we were thoroughly tired out by our three hours' tramp up and down the numberless yardangs which stretched at right angles across our path.

But, at all events, we had by a lucky chance hit upon the continuation of the Kömur-salldi-yoll, or ancient road from

Korla to Sa-chow and Peking, along the northern shore of Lop-nor.

At this point Abdu Rehim was to leave us. His pay amounted to 1½ yambas (£12), a big sum, but nothing like too big considering his excellent services and the valuable information he had given me. Along with him I sent Khodai Kullu to carry the wood-carvings we had discovered, ordering him by some means or other to take them from Singher to Tura-sallgan-uy —a task which he executed to my perfect satisfaction. On the following morning, then, Abdu Rehim and his companion set off to return to the north. They hoped to make Altimish-



"They Stood upon Mounds of Clay."

bulak in a single day, for we were unable to spare them one drop of the water we carried with us. Indeed, our supply was run so low that I dared not stay more than one day at this place, interesting though it was. By this departure the caravan was greatly reduced in numbers, for I had now left with me only Chernoff, Faisullah, and Ördek, with four camels, one horse, and two dogs.

It was very late when we started, for I went back to the ruins for a further examination, and this occupied a good half day. Amongst other things I took a couple of photographs, measured various dimensions with the tape, and made sketches of several details. The smallest building, to judge from the cups for offerings, as well as from its decorations, was a temple ; its walls measured 18¼ feet by 21½ feet.

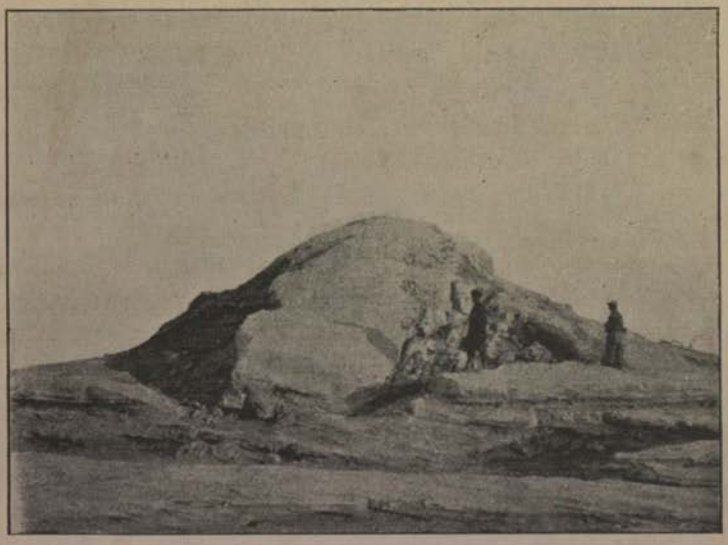
The ground-plan of the larger house measured 172 feet by 59 feet, and its longer wall lay along a line that stretched 22° west of south and 22° east of north. Its main uprights projected above the mound, and the latter was everywhere greatly eaten away by the wind. The building had been divided into several rooms of different sizes; one of the door-frames still remained *in situ*. Those parts of the timber which were buried underneath the sand were particularly well preserved, whereas the parts which were exposed to the atmosphere were greatly decayed, soft, and often frayed at the extremities. Round the square mortises of the upper beams into which the tenons of the corner uprights were fitted, we could still see in some cases the marks of the graphite pencil with which the outline of the mortise had formerly been marked. Several of these corner-posts were beautifully ornamented and turned in such a way as to resemble a number of globes and disks piled one upon the other.

One of the outer compartments had probably served as a sheep-fold, for its floor was covered with a layer of sheep-dung a foot thick. It is true the Chinese use sheep-dung as fuel, yet in a region so amply furnished with wood as the northern shore of Lop-nor, economy to this extent would surely be superfluous. The whole of the roof lay on the west side of the house, where it had been swept by the last east wind it was unable to withstand. The whole of the timber was poplar wood from the immediate neighbourhood. The principal beams measured 13 inches by $8\frac{1}{4}$ inches. Judging from the contours of the ground, these two buildings, together with a third which was almost entirely destroyed, had once stood on a peninsula that jutted out into a lake, or on an isthmus between two lakes. Whence we may perhaps infer that the outline of the former Lop-nor was quite as irregular and capricious as that of the present Kara-koshun.

What purpose did these houses serve, and who were the people who built them and dwelt in them? My first impression was that they had been an *örtäng*, or larger station, on the route to Dung-khan (or Sa-chow). These questions I will not, however, discuss here, but will leave them, as well as a fuller discussion of the problem they raise, to a later chapter; and the reason for this will appear presently.

Whilst I and Chernoff were measuring the houses, the other two men, from an early hour in the morning, explored the vicinity, though without discovering anything of importance. We therefore loaded up our camels and continued our journey towards

the south-west. Indeed, we had no choice but to follow in that direction, because the yardangs, as well as the trenches which had been furrowed out by the wind, all ran that way. After a while the sills or "isthmuses" at the ends became lower, and rudimentary dunes made their appearance. Decayed forest was very common, though the trees occurred in clumps or grooves, without doubt marking the islands of the ancient lake. What a contrast to Kara-koshun, where there does not exist a single poplar! Milliards of snail shells littered the ground, and the hard, sharp stubble of the kamish and rushes was not at all pleasant to the camels' soft-padded feet. Some day when the



Chernoff and Abdu Rehim beside a Tora in the Desert.

Kara-koshun is drained dry it will in its turn show a similar kamish stubble.

The sand soon came to an end again, but it was nothing more than an outlying strip. Here, where water was formerly so abundant and vegetation so luxuriant, everything was now dead, desolate, and arid. After a march of 12½ miles we halted in a slight depression, where two or three tamarisks still struggled for existence, so that we hoped, consequently, to find water by digging for it. But when the men were ready to begin to dig their well, they discovered that they had left the spade at the ruins, and Ördek, who was responsible for having left it behind, at once proposed to go back and fetch it.

I hesitated to let him set out on such a perilous expedition alone, at a season of the year when there was the greatest risk of being overtaken by a sand-storm; but as we had only a short supply of water, and could not get any more without the spade, I reluctantly allowed the man to go, bidding him stick closely to our trail. Before he set out, I made him take a couple of hours' sleep, and instructed him that, if he failed to find us when he got back, he was to keep on due south, and he would sooner or later strike the shore of the Kara-koshun. We could not afford to wait for him; but with the view of helping him to travel faster I let him take the horse. After a thorough good supper of rice and bread he started, about midnight, on his lonely ride through the desert.

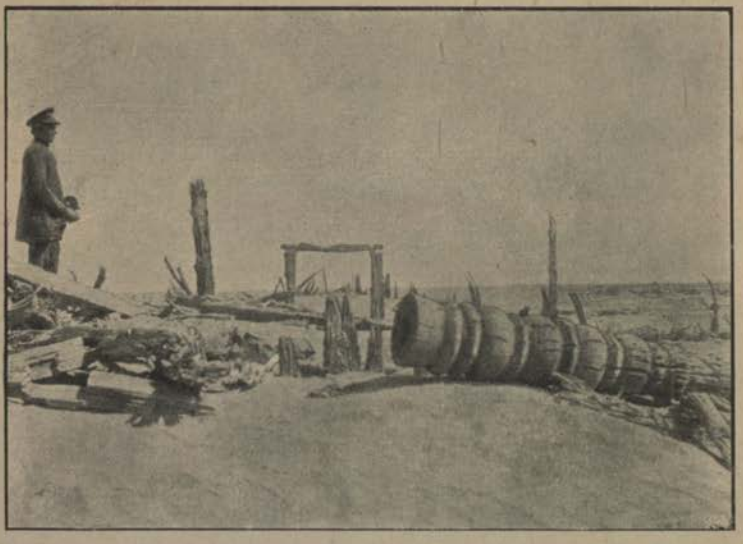
What I had feared happened about two hours after he left, for at two o'clock I was awakened by a gale blowing from the north-east; and it continued all the following day, whirling up the sand before it, and making the air thick with dust. It was impossible to see very far, and the worst was, our trail would very soon be obliterated. However, I trusted that, when the storm broke out, Ördek would have the good sense to turn back and leave the spade to its fate.

For us, however, who were travelling towards the south-west, the storm proved very welcome: blowing at our backs, it helped us on, as well as moderated the intense heat of the sun. The desert now became more desolate than ever, the decayed forest had almost entirely disappeared, and the sands were continuous except for an occasional small bayir; but the sand-dunes were as yet only 16 feet high, though we observed that they increased in height towards the west and south-west, the directions in which the drift-sand was carried by the wind. The dead kamish we passed was also bent in the same direction, as though it had been flattened down by a gigantic brush.

We pitched Camp no. XVIII. on a spot where we chanced to find two or three pieces of timber. Whilst we were still busy with our preparations for the night, we were overtaken by Ördek, who came walking, leading his horse, and carrying his spade. Both man and horse were utterly exhausted by their 36 miles' journey over difficult ground. After resting for about an hour Ördek came to me bringing news of the very utmost importance.

In the storm he lost our trail and got astray, but finally came to a tora, or landmark tower, in the vicinity of which he

discovered several houses, richly decorated with carved panels. He also collected earthenware cups, iron bars, axes, pieces of metal, money, and several other things, some of which he had



Chernoff amongst the Ruins.

A Door-post still Standing *in situ*.

brought with him to show me. He also appropriated two of the carved panels, the best he could lay his hands upon, and then went in search of the place where he had previously discovered the

three ruined houses, and at length found them. But he could not induce the horse to carry the panels, the animal stubbornly refusing to let him put them on its back; so he was forced to carry them himself. His shoulder was actually bleeding from the pressure of the rope by which he carried them. Upon reaching Camp no. XVII. he again tried to fasten them on the horse; but the creature broke from him and galloped off into the desert. After a great deal of trouble he managed to catch him again; but he was then so tired that he left the panels where they were, and followed after us on horseback. The camels' trail was still plain to see on the clay, although quite obliterated on the sand.

This report made one thing instantly clear to me—namely, that I must recast my plans for the following year. Meanwhile, I ordered the unfortunate Ördek to go back next morning and fetch the panels; which he did before we started. The panels were exceptionally well preserved, and had on them flowers and garlands carved in relief. I was strongly tempted to turn back at once, notwithstanding that it would have been the height of folly, for our supply of water would only last two or three days longer, and the hottest part of the year was rapidly approaching. No, I must alter my plans entirely. These ruins must be visited at all costs. That summer was, however, to be spent in Tibet; consequently I should have to return to the Lop country next winter. But there was one very important question: Should we be able to find the place again in such a terribly uniform region as this flat desert, in which there was not an object that could serve as a landmark? I did not doubt it, for I had the most implicit confidence in my map. Ördek declared that if only I would pilot him to Altimish-bulak, he was positive he should be able to find again the ruins he had discovered. How I blessed that spade, and, above all, Ördek for forgetting it!

The Desert of Lop is even more desolate than the Desert of Cherchen, for whereas we did find both grazing and water in certain parts of the latter, it would have been altogether useless to dig for water in the former. We still kept observing snail shells and old earthenware potsherds scoured by the wind. On the night of the 31st March we encamped beside a dead tamarisk, where the dunes were about 20 feet high, although latterly the sand had only occurred in belts. The camels had drunk no water for five days, and consequently were tired and listless. But we were still 35 or 40 miles from Kara-koshun, and should have to push on faster.

When we started next morning, I led the way as usual, and steered due south. In every direction barren dunes, the same dreary waste of desert which I had seen so many times before! However, a piece of a bird's egg indicated that we were approaching regions somewhat less God-forsaken. Having climbed to the summit of a high dune, I flung myself down to rest a bit, for I was tired, and scanned the horizon with my field-glass. Nothing but sand—ridges of sand! Yet, stay, what was that? Away to the south-east—wide sheets of water, flowing in amongst the dunes and yardangs! Water in the middle of the desert? I dare not trust my eyes—it must be a mirage!

The Scene of Ördek's Discovery—Photographed a Year Later.

However, I at once jumped to my feet and hurried on as fast as I could. No, it was no mirage, but verily and truly a lake, meandering into and around creeks, bays, inlets, islets, sounds, isthmuses in the most fantastic way possible—it was, in fact, such a labyrinth of waterways as could only be formed on perfectly level ground amongst a multitude of sand-dunes and wind-sculptured terraces. Except for a few young tamarisk sprouts, which had taken root in the soft, marshy ground, and a score or so of kamish stalks, the region was every bit as destitute of vegetation as the country we had just travelled through. It seemed as though it had only quite recently been overflowed. The contours of the lake were in great part

determined by the yar terraces. In one or two places the dunes were broken down and had been carried away by the water.

I continued south-westwards along the deeply-indented shore. The lake soon contracted, narrowing greatly, but very shortly afterwards it widened out again. The water had a slight saline flavour; nevertheless, all our animals drank it and enjoyed it. After a while the shore-line wheeled away to the north, and we were constrained to follow it, for we failed to discover any ford thereabouts, and without something of the kind the camels would have stuck fast in the mud. The lake sent out several long "fingers" towards the north-east, each of which forced us to make a detour. On our right we sometimes had small self-contained lagoons and pools. The ground was moist, and "wobbled" unpleasantly under the feet of the timid camels. In fact, it was like walking on a sheet of indiarubber spread out over water, for the mud "billowed," as it were, in front of us as we walked.

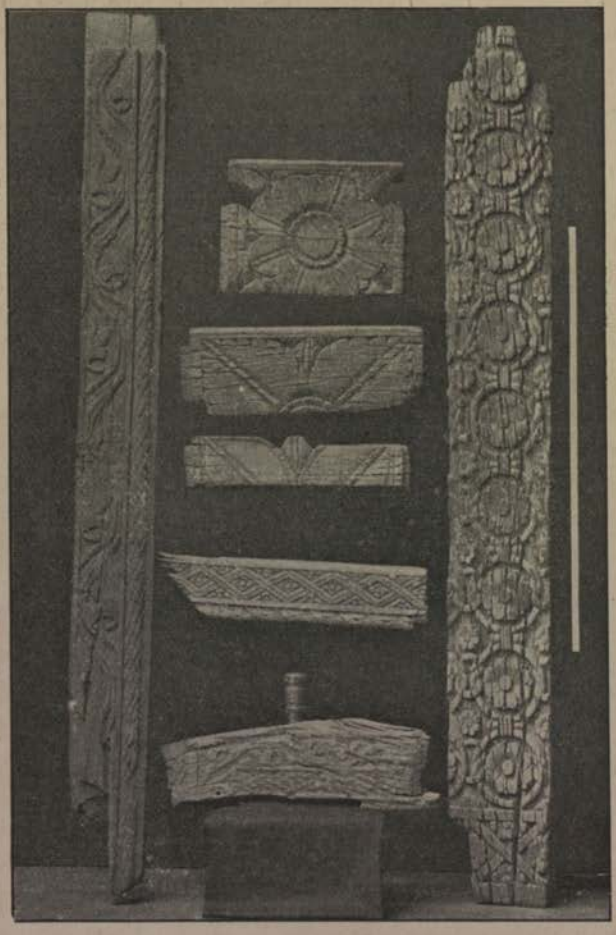
The country was absolutely sterile. The lake appeared to consist, as it no doubt really did consist, of a great number of parallel bayirs and yardangs—valleys between the sand-dunes, and furrows ploughed up by the wind—all stretching from north-east to south-west. In many places the yardang ridges were easily perceptible under the water.

This lake could hardly mark the beginning of the Kara-koshun, otherwise it would have possessed a superabundance of reeds. Where, then, did it come from? The slightness of its salinity proved that it was tolerably new. Had it been long in that locality the kamish seeds would have grown up, for they follow the water with incredible rapidity. I could only surmise that it came from the new branch of the Shirgeh-chappgan, which Togdasin Beg had told me about.

But, interesting though this new discovery was as a contribution towards the solution of the complicated Lop-nor problem, it was of little profit to us in the meantime. What we wanted most especially just then was fresh grazing for our animals and meat for ourselves, for the only supplies we had left were rice and tea, meagre provisions to satisfy thirst and hunger upon. Instead of advancing well to the south, we had been stopped by this unexpected lake—a proper trick for the First of April!

As the water stretched away for ever so far towards the west, I resolved to wait and see whether we could not find a ford. It was evident we were confronted by a newly-formed branch of the

Tarim, which we must somehow get across. It is true there was no current perceptible; but there was a newly-made "beach-line," showing that the surface of the water had dropped about 3¼ feet in consequence of the subsidence of the Tarim in the winter.



Some of Ördek's Discoveries—A Meter-length (3.281 feet) is Shown on the Right by Way of Scale.

The large dunes which encircled the lake on every side, and sometimes even formed islets in it, were a proof that they were already there when the water first overflowed the district. Had it not been so, the dunes would have been arranged in a very different way, that is to say, they would have been absent on the south and south-west of the lake, where now, as a matter of fact, they were highest.

On the 2nd of April Chernoff searched and searched until he at last did find a ford, with a firm sandy bottom and about 3 feet of water over it. The camels delighted in the water. Once across, we pushed in amongst the high sand-dunes, and the lake very soon disappeared behind us. At one place we crossed over a bayir, the floor of which was strewn with cylindrical incrustations of lime, which had been formed round the stalks of reeds, as also crystals of gypsum, which adhered to our naked feet, for we often marched barefoot. The sand increased in volume. I measured the crests of some of the highest dunes with the levelling mirror, and found them to be 25 to 35 feet high.

My Mussulmans were discontented; they believed the lake we had left behind us was the Kara-koshun. Indeed, I began to wonder myself whether it was not so. If it were, we were lost. The poor camels, toiling through the sand, kept looking wistfully behind them, as though they too were wondering why we had left such a comfortable spot. The heat was intolerable, and the sun shone straight in our faces. However, we were not in quite such a perilous position as we supposed. The country soon altered its appearance again, and for the better, in that the sand grew less, and we came to a belt of dead poplars and then beyond that to another of living tamarisks. In front of us was a hill about 16 feet high. I invited Faisullah to follow me to the top of it, and have a look at the Kara-koshun. And, sure enough, there it was, in the south-west, the south, the south-east, and the east—a succession of sheets of pure blue water, some large, some small, and separated from one another by belts of yellow kamish (reeds).

We pitched the tent on a promontory that jutted out into the first large expansion of the lake we came to, putting it close at the water's edge, the entrance being turned towards the north-east, and as soon as my bed was arranged, I lay on it, and through my glass watched the flocks of wild geese and ducks and swans which swam about and disported themselves on its surface. For a desert-farer it would be impossible to imagine any sight more beautiful! Unfortunately the birds kept too far from the shore; but from the way in which they dived it was clear that the lake was not very deep. Its water was perfectly fresh.

Here was my tent canvas flapping in a fresh breeze that blew off the lake. What a difference from the desert wind, with its choking clouds of dust! The lapping of the water against the shore was perfectly delightful as I lay and listened to it whilst summing up the results of the expedition. We had established

the existence of an ancient Lop-nor lake-basin ; we had discovered an ancient inhabited place, and met a new lake wandering through the desert—all without losing a single man or a single animal.

But the contour which I had obtained by marching diagonally across the lake was not sufficient. Boiling-point thermometers and aneroids are not of much use in a region where differences of level were so slight as they were here. This strengthened me still further in a resolution I had formed, to make a detailed survey of the lake-basin as the only means of determining accurately the small difference of level which existed between Lop-nor and Kara-koshun. After my former journey in Central Asia, I had maintained that Lop-nor must be a migratory lake, basing my inference on the fact of the almost uniform level of the whole of that region.

CHAPTER XXIV.

BOATING ON THE KARA-KOSHUN LAKES.

On the 3rd of April it blew hard from the north-east, until the wind attained a velocity of over 22¼ miles an hour. The lake possessed for me an irresistible attraction. After all the choking sand and burning heat of the desert, I should like nothing better than to be tossed on its crisply curling waves, and sound its depth; but unfortunately we had no boat. Still we had goatskins; and out of them and the frames to which they were fastened, we ought to be able to construct some sort of a craft, that would at all events carry us if we drifted across the lake before the wind. The lake extended from the north-east to the south-west, so that all we had to do was to find a suitable starting-point. Accordingly, I set off along the shore, with Chernoff and Ördek, taking the materials for our "boat" on the back of a horse.

Upon reaching a little cape that jutted out into the lake, we stopped, tied the frames fast with ropes to two poles, and then floated the airy raft, thus fashioned, on six goat-skins, which Ördek inflated by blowing into them. Then Chernoff and I embarked, each astride a pole. When Chernoff took his seat, the whole affair very nearly capsized, and when I joined him, the goat-skins became entirely immersed, carrying the frames down a little way with them, and there we sat, half-naked, with our feet dangling in the water. Our own backs were our sails, and away we went straight for the camp, which was visible to good eyes in the far distance, 60° west of south. The wild-duck, terrified by such a strange object approaching, rose in hundreds, screaming and quacking. When the big waves rolled in upon us, we were forced to hold on to each other, to preserve our balance and prevent ourselves from being capsized. Every wave which came broke right over

us, so that we were quickly wet through. The voyage lasted two and a half hours. The water was now neither perfectly fresh nor perfectly clear, for the wind forced it out of the stagnant reaches and blew it westwards. On the shore where we were encamped, the level rose 6 inches. The greatest depth we sounded was 12 feet.

Over against our camp the lake was very shallow, so that Ördek waded out a long way before he was able to haul us in. We were both so stiff with cold that we were hardly able to walk up to the fire, and upon reaching it I was at once seized with a violent shaking-fit, so that my teeth "dithered" and rattled together. Flinging off my wet clothes, I dried myself by the fire, and then crept into bed. But even with the help of a big cup of boiling hot coffee, and a change of warm clothing, it was a full hour before I was able to shake off the attack.

The sky at sunset exhibited marvellous colouring, especially over the dunes to the north, which were lit up with a yellowish red gleam. Meanwhile, the wind increased to a full-fledged buran. The waves drove so fiercely against the shore, that the spray was blown right over my tent, and I judged it expedient to move it further back from the lake. As the storm thus continued to rage, we let the camels have another day's rest. Both north and south of Kara-koshun the horizon blazed in a fiery yellow; but towards the north-east it was a dark steel grey, indicating not only that the water stretched a long way in that direction, but also that it was accompanied by an absence of drift-sand.

When we started again, on the 5th of April, I hoped we had no great distance to go before striking the first inhabited village beside the Kum-chappgan. The wind still blew strong, and as the thermometer registered only 8°.1 C. or 46°.5 Fahr. it was decidedly cool. But in the afternoon, it turned warm again, and the sun shone directly in our faces. The lake-side was bordered with reeds, and on our right the sand-dunes approached quite close to it. The waters were alive with wild-duck, wild-geese, swans, divers, gulls, and terns, and crows were numerous. Hares, too, and hedgehogs were not uncommon. The shore was literally net-worked with the tracks of foxes, deer, lynxes, and wild boar. About two months before, a couple of hunters had been out on the ice; their foot-prints were still quite plain to see in the moist clay.

Our route was intersected by a vast number of long narrow

arms from the lake, separated by belts of desert, and each of these compelled us to make a detour round it. Snail shells and dead kamish were present not only close along the shore, but also at a considerable distance away. Both alike belonged to a far distant past, and were older than the lake. Next we crossed a brook, which had a volume of 123½ cubic feet in the second and a maximum depth of 2 feet 8½ inches. It was steadily rising, a fact proved by the successive rivulets which broke off from it and poured themselves into the little depressions at the sides. At Camp no. XXII. we were for the first time annoyed by gnats.

The next day we continued our journey under the same conditions. I hurried on on foot, resolved not to stop until we met with human beings. Not that we were longing for company; but we wanted fish, we wanted poultry and eggs, and above all, we wanted a boat, that I might explore the actual extent of the lake. Towards evening I caught sight of a thick column of smoke rising from the middle of the immense marsh which stretched away to the south; and sent off Ördek to see if he could get hold of the men who made it.

He came back towards evening, bringing with him eight Lop fishermen, and a supply of urgently needed stores—wild-geese, two score eggs, a large quantity of fish, flour, rice, and bread.

On the 7th, the Lop-men guided us to Kum-chappgan. The wind again blew hard, at the rate of 31½ miles an hour. During the continuance of a storm such as that the variations of temperature are not very great, the minimum on this occasion being 12° C. or 53°.5 Fahr., at noon 14°.6 C. or 58°.3 Fahr. and at one p.m. 16°.6 C. or 61°.9 Fahr. We had no reason to complain of the heat, and the gnats were all blown away.

Upon reaching Kum-chappgan, we encamped in the bifurcation between that channel and the Tuzun-chappgan. The huts which we built in 1896 were still standing as we left them, and all the other surroundings of the spot were precisely the same. During the night, it rained heavily, the drops smiting the tent very audibly—a rare occurrence in this part of the world. The men who were lying out in the open were driven into the nearest *sattma* (reed hut).

The next morning there arrived two old acquaintances, namely, Numet Beg of Abdall and Tokta Ahun, son of that fine old fellow Kunchekkan Beg, who had died two years

View from the Northern Shore of Kara-koshun.

previously. Numet Beg proved himself a very useful man in a many ways. The first thing I set him to do was to take charge of the camels and horses, lead them to the pasture-grounds of Mian, watch them there, and finally return them in good condition when we were ready to start for Tibet. Besides that, I asked him to find us provisions and guides to take us back to Tura-sallgan-uy, a journey which I purposed to make by canoe.

A Chappgan or Reed-pass in Lake Kara-koshun.

We utilized the stay at Kum-chappgan by making two long boat excursions—the first to the same localities that I visited in 1896, the other through the Tuzun-chappgan, and along parts of the lake in the south which I had not hitherto visited. We set out in two canoes—Chernoff and I in a large one, with three men to paddle, and Faisullah in a smaller one, with the provisions and two boatmen. The reeds were wet after the rain, and gave us many a shower-bath, as we glided through them like eels.

During the four years since I last saw it, this alluvial region

of water, reeds, and sand had totally altered its appearance; its features were no longer recognizable. Lakes which in 1896 were perfectly open and free from weeds were now completely overgrown with kamish, while new ones, with new names, had been formed alongside them. Names such as Kum-köll (Sand Lake) and Yanghi-köll (New Lake) fully explained themselves. The greatest depths we sounded during the trip were 16 and 17 feet, and these soundings, significantly enough, were made in a recently formed basin called Toyagun —a proof that deeper depressions may exist by the side of the Kara-koshun, while the older portions of the lake itself are gradually shallowing and becoming overgrown with reeds.

On the way back our boatmen caught with their naked hands a big, beautiful swan. We first observed it swimming in open water at the edge of the reeds; but when we approached it the bird dived. Then the boatmen just made their paddles spin, and we flew along to the spot where, judging from the dimples on the surface, the swan would in all probability reappear; and, sure enough, when it did emerge, we were so close to it that, in order to escape us, it was forced to plunge blindly in amongst the reeds. That was its doom, for amongst the reeds it was unable to spread out its wings to fly. After the swan darted the canoe. Overboard into the water jumped old Yaman Kullu, although it came up to his waist, and, seizing his victim with both hands, dragged it into the canoe. The swan was so terrified that it lay as if dead, with its neck limp and its head hanging down, but we killed it at once. Close beside us was a dead swan, entangled in the reeds. It had been wounded some few days before, and it was its mate which we had captured and delivered from its grief. The lake literally swarmed with wild-duck and wild-geese.

On the 10th of April I measured the volume of the Tarim at the point where it entered the marsh: it was 1,049 cubic feet in the second. At the same place and the same time of year in 1896 its volume was 1,784 cubic feet. This difference was, no doubt, due in part to the newly formed branch of the Shirgeh-chappgan, in part to a number of natural canals which had broken away from the main river above Kum-chappgan since my former visit.

The sand-dune to which Kum-chappgan owes its name was 33½ feet high. The maximum depth of the lake was 17 feet. This vertical altitude of 33½ plus 17 = 50½ feet may

be regarded as the maximum for the whole of the lower Lop-nor basin.

On the 11th we started on our second canoe expedition to the southern parts of the Kara-koshun. These were essentially different from the northern parts; for instance, the maximum depth was 6¼ feet, but throughout the whole of the second half of the trip the depth was one foot and less. The bottom consisted of fine yellow mud, resting on black ooze or blue clay. A touch of the paddle made it boil up like ink. When the water grew too shallow to float the canoes, the men simply stepped out and dragged them after them with ropes; but even this method of progression soon proved impossible, and we were compelled to turn back. The black ooze was 4 inches deep, but underneath it was a hard though thin layer of salt. Immediately north of the desert-road which leads from Abdall to Sa-chow was an extensive but shallow sheet of water, called Sateh-köll. It contained few reeds, and no *algæ* on the bottom, and was frequented by neither bird nor fish. During the summer it dries up completely, and its bed becomes converted into a hard and cracked layer of clay. Another proof that the Kara-koshun is travelling back towards the north. The marks on the stalks of the reeds plainly showed that since the ice broke up, six weeks before our visit, the level had fallen nearly 10 inches.

The next day we rowed to Abdall, where the camels met us, and encamped on the left bank of the Tarim, which had there a volume of 3,295 cubic feet in the second. Thus the river had lost 2,246 cubic feet in the short distance between Kum-chappgan and Abdall. The delta of the Tarim was travelling back up stream, like the numerous lakes formed by the many arms of its delta. The river now stood at its highest point since the melting of the ice in the spring, the level being about the same as that to which it attains when the ice begins to form in the autumn. In summer the river is 9 feet lower.

A short day's journey north of the district of Abdall, the desert was ploughed up by a recently formed arm, which broke away from the Lower Tarim at Shirgeh-chappgan. As this had never been visited by anybody except the hunters of Abdall, I decided to map it. But it was only possible to approach it by canoe. The camels dragged (see p. 329) across the strip of sand that intervened between us and it a couple of canoes,

drawing them like sledges. Then I took the instruments with me in one canoe, while Chernoff had the supplies and stores in another; but the latter was so heavily laden, that the gunwale was only 1½ inches above the water, and in the opener reaches the waves washed over her. Tokta Ahun, old Yaman Kullu, and two other boatmen also accompanied us.

It was a difficult journey. The buran whistled and "shrilled" through the reeds, forcing us to keep as much as possible behind the shelter of the kamish beds. Out in the open lake, the least ruffling of the surface threatened to swamp our frail craft and send them to the bottom. In the dense thickets of reeds the daylight was little better than twilight. Every now and again a fish leapt to the surface. Swans and wild-geese darted away as we approached them, and on two or three occasions lost their eggs.

So long as we were able to make out the current, and kept to it, all went well. But at last we lost it, and soon got entangled in an impenetrable labyrinth of kamish beds, tamarisk mounds, alluvial formations, capes and promontories. Here we spent over three hours trying to find a passage, and in the end were forced to go back the way we had come. A second time we got lost in the winding channels, and were again obliged to turn back. Then by sheer force we drove the canoes through the crackling reed-beds. We got out, and dragged our craft across the reed-grown tongues of land which parted one basin from another. We climbed every sand-dune to see what we could make of the country; but the atmosphere was so hazy, owing to the storm, that all we could distinguish was an inextricable tangle of thicket and watery jungle.

Failing to discover a passage, we at last set fire to the kamish. At once a magnificent spectacle broke upon the hazy dimness of the atmosphere. The flames flung themselves upon the rain-dripping reeds. The reeds burst with loud reports, crackled, shot up dense clouds of black smoke. The storm seized them, whipped them to pieces, and tossed the trailing fragments like a tattered mourning-veil over the endless marshes with their labyrinthine reed-choked channels and water-ways. The air was thick with soot-flakes, so that, as we staggered about in the shallow water, hauling our canoes into the reedy lane carved by the flames, we got grimy as well as wet.

At length we found the current again, and it was now so swift and strong that the boatmen were forced to paddle with all their might to make headway against it. After spending some time in a vain search for a suitable spot to encamp in, owing to the moistness of the adjacent shores, we were at last obliged to put up with them, moist though they were, and make the best shift we could by spreading dry kamish at the foot of two or three tamarisks. The storm meanwhile lashed the river till it became specked all over with foam.

Next morning there were few inducements to continue the journey. To the north the sky was a blackish grey, owing to

Dragging the Canoes across a Tongue of Land.

the drift-sand, and the agitated surface made it difficult to see which way the current ran. It was 11 o'clock before we got started. We steered towards the north-west, across a series of elongated lakes, which took us again into what was decidedly a river-bed, for the channel narrowed to some 30 feet and the current flowed at the rate of two miles an hour. Then followed a complicated piece of the delta, called by the natives, Tokkuz-Tarim, or the Nine Rivers, from the number of arms into which the river was split.

The largest lake we traversed in the course of the journey luckily extended from north to south, and by keeping close to its eastern shore, which was shielded by high sand-dunes,

we were able to obtain a certain amount of shelter. To have gone straight across it would have been perfectly impossible, for it was whitened with the breaking crests of the waves; and it was more by a lucky fluke than by any exercise of skill that we managed to hit the continuation of the river on the other side of it. After that, the channel turned, and the current, coming from the south-west, was neutralised by the wind. At Camp no. XXX. the river-arm which we had just ascended carried 374½ cubic feet in the second.

Our next day's journey was just as intricate, and the wind still continued to blow. During the night the thermometer fell to a maximum of −0°.3 C. or 31°.5 Fahr. We kept close to the bank, although that frequently took us into watery *cul de sacs*. A young shepherd, whom Tokta Ahun had somewhere got hold of, acted as our guide, until we reached a *sattma* or fisher's hut, where we exchanged him for an old fisherman, who led the way in his canoe. Without his assistance, it would have been impossible for us to find the mouth of the river, for it was completely masked by reeds. A little higher up he piloted us through a channel which was barely a yard wide, until we came to a cataract nearly two feet high. There it was necessary to land, drag our canoes after us through the reed thicket, and again launch them below the falls.

This and another small cascade, in the same locality, suggested that the arm of the Shirgeh-chappgan had a bigger fall than the principal river, which consequently must flow at a higher level. All this threw light upon the tendency which the river showed to travel towards the north and pour itself into the flat depressions which existed there. A difference in level of only a bare yard is a very important matter in a region which is everywhere almost perfectly horizontal.

At Yekken-öy we found a small village of only four sattmas, with a score of inhabitants, all of them old men, women, and children. The able-bodied men of the community had gone to Charkhlik to sow their crops and cultivate the ground. Their other chief means of subsistence were fishing and catching wild-duck, as well as collecting the eggs of the latter. The villagers owned also 150 sheep and some cows. They had migrated to their existing quarters four years before, coming from Chegghelik-uy. They told me, that the new river-arm which flowed eastwards out of their lake was only seven years old. On the 18th of April we, followed by a

A Branch of the River winding through the Reed-grown Sands.

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large flotilla of native canoes, steered south-west across a string of lakes, which had a maximum depth of only 15 feet. These lakes possessed one peculiarity, in that the water they contained flowed at one and the same time in two opposite directions—both east and west. While the main volume of the water went eastwards, a portion ran westwards and entered the Tarim at Shirgeh-chappgan. They were, however, situated 23½ inches above the level of the Tarim. Gradually we wormed our way into a *kok-ala* or small stream, which meandered into the Tarim, where its crystal clear water instantly became absorbed by the muddy current of the larger river.

A little distance down the Tarim we halted at Shirgeh-

The Tarim at Shirgeh-chappgan.

chappgan, whence we had a splendid view of the great river itself. It was straight and regular, and bordered by rows of shady and venerable poplars. Here two channels, flowing out of the lakes of Yekken-öy, restored to the Tarim 198 cubic feet of water per second; while the Tarim itself had a volume of 3,828½ cubic feet in the second, the greatest volume I had hitherto measured in this stream.

During the night of the 19th April the thermometer again dropped to −4°.0 C. or 24°.8 Fahr., a quite unusual thing at this season of the year. Picking up Faisullah and Ördek, with the dog Mashka, I now purposed to row back to Tikkenlik by the lakes which I discovered during my former journey. It was of course irksome to have to traverse the same ground

again, namely, the two days as far as Kum-chekkeh ; but as the hydrographical relations had in the meantime changed, it would not perhaps be time altogether wasted. Hence, leaving the Niaz-köll on the left, we paddled across Chong-köll, which fully justified its name of the Big Lake. Indeed, in our frail canoes we did not dare to venture very far away from its shore. After that we penetrated up a large river-arm, which ploughed its way through an expanse of pure sand, and was called Lailik-daria. It carried a volume of 738 cubic feet, or 165½ cubic feet more than did the two channels (see pp. 400 and 401) which flowed out of the lakes of Yekken-öy. By taking a series of similar measurements along this eastern arm, I should be able to infer what its real character was, and ascertain what quantity of water it bequeathed to the lakes along its course, or lost by evaporation, how much was absorbed by the ground, and so forth.

During the four years which had elapsed since I last saw it, the Sadak-köll had totally changed its appearance ; not only was it choked with sand and alluvium, it was also overgrown with reeds, through which a strong current forced its way. The huts in which I had formerly taken shelter from a storm were still standing, and their inhabitants were for the most part the same ; they recognised me again, and gave me a most friendly welcome. They called their village, with its 26 inhabitants, Merdektik, because it was situated at the mouth of a new river-arm, which emerged from the Merdek-köll, and after passing through a considerable lake to the east, here discharged its 83½ cubic feet of water in the second. This again was another proof that the entire hydrographical system of the Lop-nor is moving northwards, back again towards its ancient basin.

A fisherman from this village guided us from his canoe against the swift current. The shores were lined with young tograk woods ; the trees, having just put forth their fresh, spring foliage, were very attractive, especially when compared with the yellow glare of the barren desert behind them. The velocity of the current varied with the depth ; sometimes it flowed at the rate of two and a half miles an hour, rippling and gurgling against the poplars which stood in the stream. We stopped for breakfast at Kulakchah, and found there the same five families whose acquaintance I made in 1896.

Since my last visit the shepherds of the neighbourhood

had built a permanent bridge across the river, consisting of beams, branches, and reeds, so as to be able to drive their stock over from the one bank to the other during the summer. It was, however, so low that a man in a laden canoe was only just able to pass underneath it. However, it made a picturesque feature, with its beams and timbers mirrored in the

The Arm of the Merdek-köll Entering the Desert.

A Bridge Over the Ilek.

inky black waters of the Ilek, which nevertheless were perfectly transparent.

Thus we paddled along at the rate of four miles an hour between the luxuriant woods and the impenetrable reed-thickets, and finally arrived about sunset at Kum-chekkeh, where we were again welcomed by old friends of 1896. Next day, one of these men accompanied me to the Merdek-köll, when I went to map it. This lake received 247¼ cubic feet of water in the second from the Ilek, and was in places 24¼ feet

deep, that is to say, it was considerably deeper than the Kara-koshun.

Above Kum-chekkeh the river, with its borders of magnificent woods, made a picture of exceptional beauty, quite park-like in its intermingling of wood and water. The volume of the stream was 950 cubic feet in the second, and increased as we ascended, for lower down in the direction of Yekken-öy the lateral lakes and side lagoons levied heavy contributions from it.

Between the lakes of Arka-köll and Tayek-köll, both of which I explored, we obtained in the middle of the river the

Our Canoes on the Ilek.

greatest depth I sounded anywhere in the whole of the Tarim basin, namely, 41⅙ feet. Arka-köll was in places as much as 23 to 26 feet deep. Tayek-köll—whose eastern shore we traversed with our camel caravan in 1896—was a perfectly open sheet of water, and gave in the middle depths of 18¾, 22½, and 31 feet, or nearly double the depths of any part of the Kara-koshun. When I got back to camp my tent was so full of gnats that I literally had to smoke them out.

We left this inhospitable gnat-haunted place at day-break on the morning of the 27th April. We were still ascending our old friend the Ilek, which was less like a river than an open lane through the reeds. These stretched on the west

as far as we were able to see, but on the east soon terminated in hard ground, whereon poplars were growing. Upon reaching the lake of Suyi-sarik-köll, or the "Yellow Water Lake," we

Poplars Growing Beside the Ilek.

Among the Reeds in Suyi-sarik-köll.

turned to the west, and plunged into another unconscionable tangle of kamish, through which we found our way by means of an ill-preserved *chappgan*, or channel. The interior of our

reedy tunnel was dark and stuffy. The reeds, which were bent across the narrow waterway by the incessant storms, were, moreover, heavily laden with dust and drift-sand. In some places they formed a kind of bridge, on which a man could walk long distances. As a rule the water was six to seven feet deep, and percolated through the myriads of reed-stalks into the Ilek. That evening we encamped at the village of Sheitlar, which we had visited during the preceding winter, so that I thus secured a point of connection with the map that I made during my journey through the Desert of Cherchen.

Next day, taking two men with me, I made an excursion to the Kara-köll. A north-easterly gale of the worst description was blowing, and it was as dim as twilight, when we rowed round the biggest sheet of water, hugging the reeds or keeping just along their fringe, where the force of the waves was broken. On this lake were several floating islands, consisting of kamish roots matted together with clay, mud, and rotting *algæ* from the bottom; some of them floated on the surface, others were partly submerged. The natives called them *sim;* some of them looked big enough to bear a man. At all events, they proved that aquatic vegetation is one of the factors which help to level up these wide and shallow marshes.

The hydrography of this region is so complicated, that it cannot be clearly understood without a detailed map; hence I cannot dwell upon it longer in this place. With Chernoff for my assistant I measured every arm and every canal which conveyed water towards Arghan and Ilek, with, amongst other things, this interesting result, that the Tarim now poured a considerably greater volume of water into the system of lakes which lay to the east of it than it did when I visited them in 1896.

On the 29th April, with a fresh set of boatmen and fresh canoes, we travelled west and north-west across the large lake of Chivillik-köll. This, like all the other lakes in that locality, was in great part overgrown with reeds and sedge. It was so extensive that we were unable to see its western shore, even from the top of a high dune, though at the same time its waving reed-beds were swallowed up in a distant haze.

Next day we were joined at Kadikeh by my old guides, Kirgui Pavan and Shirdak Pavan, who brought me the first intelligence of Parpi Bai's death. Starting again on the 1st

May, with fresh canoes and fresh men, including Kirgui and Shirdak, we steered west-north-west on the Kunchekkish-Tarim. At Darghillik we discovered in the forest traces of a score or so of huts, which the begs of Turfan used to visit in the days before Yakub Beg, for the purpose of collecting tribute of otter skins for the Emperor of China. These Chinese officials used

Our Canoes at a Night-camp.

A Bridge at Tikkenlik.

to travel by way of Turfan-köbruk on the Upper Ilek, and used to bring with them, for the begs and inhabitants of the district, presents of flour, for this, before agriculture was practised in the Lop country, was a highly valued commodity.

At the camp of Dilghi we measured a current of 2,977½ cubic feet in the second, flowing *into* the Chivillik-köll, although only a few days before we had measured a current of 3,214 cubic feet in the second flowing out of the same lake. This phenomenon, at first sight so strange, was due to the fact

that the inflow had already begun in the natural course of things to diminish, so that the lake, which acted as a reservoir and moderator, did for a time discharge more water than it received.

On the 4th of May we encamped near old Naser Beg of Tikkenlik, and from him heard good reports of our principal camp. The 5th of May we spent at Tikkenlik, for the first caravan had just arrived from Tura-sallgan-uy under the command of Cherdon. It consisted of Faisullah, Mollah Shah, Musa, Kutchuk, and ten Lopliks, together with an imposing array of 35 horses, 5 camels, and 5 dogs, all in excellent condition. Their orders were to take the main caravan

View from Kalmak-ottogo.

road to Abdall, thence strike direct for Chimen in Northern Tibet, seek out a suitable site for a camp, and there await my arrival, taking care in the meantime that the animals were fit for the laborious journey which awaited them in the summer. Cherdon still had a good deal of difficulty in making himself understood in Turki, the *lingua franca* of that region; but by dint of using it every day, he learned it rapidly.

Whilst I was staying at Tikkenlik, Jan Daloi, the amban of Charkhlik, passed the place on his way to his own town. He was an uncommonly well-bred, amiable, and polite Chinaman, who afterwards proved a very useful friend to me.

On the 6th of May we exchanged canoes and boatmen for

the last time, and started to force our way against the powerful current and formidable volume of 3,383½ cubic feet in the second to Yanghi-köll.

When we at length reached our well-known camp beside the solitary poplar, all the men were waiting to receive us. Sirkin told me everything that had happened during my absence, and handed to me his meteorological journal, together with the observations and records he had made as to the changes in the river. Whilst I was away, the men had set up in the market-place a neat little Mongolian yurt, in which I subsequently lived. The Cossacks lodged in the kamish hut; Islam Bai and Turdu Bai in the tent. My old friend the ferry-boat lay moored in her dock, but was soon destined to resume her travels.

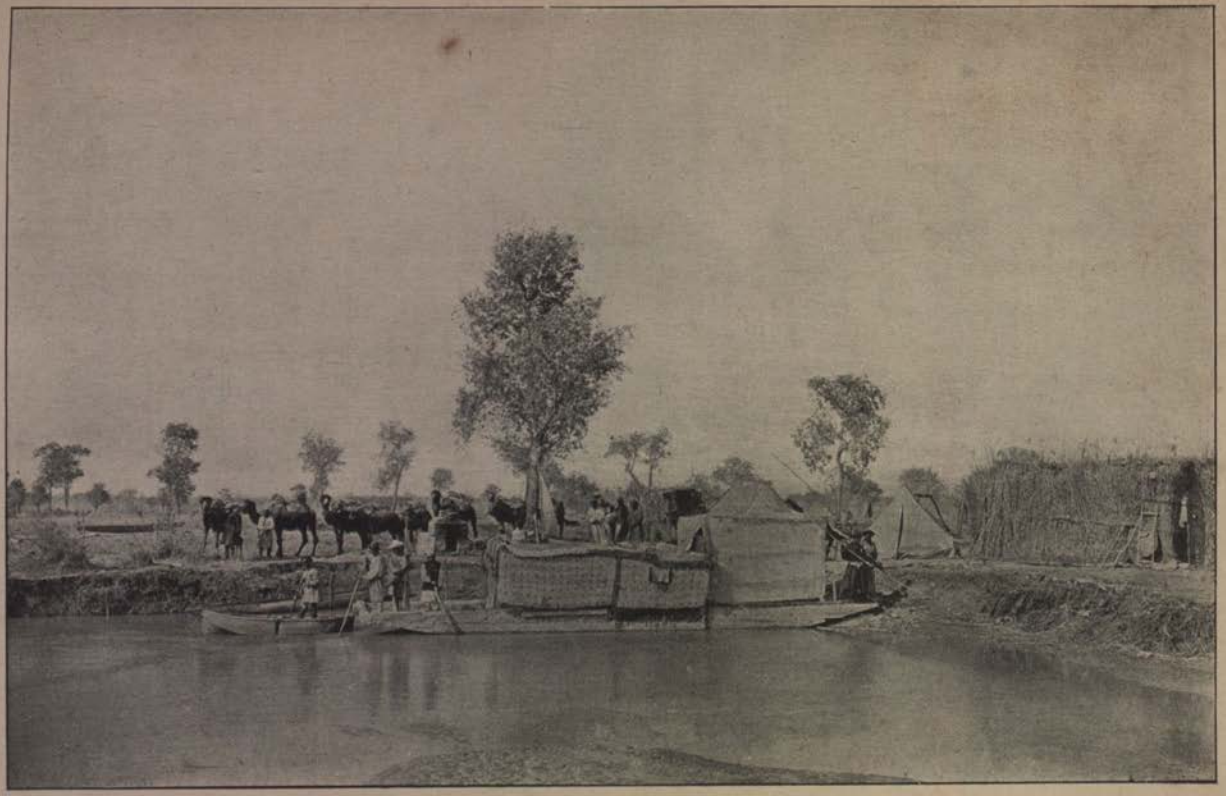
CHAPTER XXV.

SOUNDING THE STORMY LAKES OF THE LOWER TARIM.

THUS I had forged a new link in the chain of my expeditions, and brought to a close a new chapter in my travels. The base at Yanghi-köll was no longer needed; it was time to transport my possessions, animate and inanimate, to a different region, where different conditions prevailed, namely, to the inhospitable uplands which lie between the Himalayas and the Kwen-lun, the most stupendous swelling on the face of the earth.

I spent ten days at my old headquarters, partly in much-needed rest, and partly in making various arrangements. For one thing, I settled with Khalmet Aksakal, of Korla, who had provided us with horses and a plentiful supply of provisions; and when he left me I gave him my packet of letters for Europe.

During these days the Cossacks were by no means idle. They made an exceedingly judicious alteration in the structure of the ferry-boat, which we were now about to use for the completion of our journey down the Tarim. On the fore-deck, in place of the tent, they built an ordinary cabin, precisely like my dark-room, except that the uprights were covered with white felt. Two hanging felt curtains formed the front, though the one on the right hand, where my writing table stood, used only to be let down at night. They also fixed up a little awning, just above the table, to shield me from the sun, for we should be travelling south. The long wall, next the larboard passage, was made entirely of planking, near the top of which we had various hooks fixed to hang clothes on and instrument cases. Here stood three of my boxes, one of them being used as my dining table. My bed was placed alongside the opposite wall, which consisted of one big hanging felt carpet. Otherwise the cabin was kept as airy as possible. The meteorological observatory was in the same place as before, and when I lifted the short felt curtain which was



The Ferry-boat after its Re-construction.

nailed to the roof along the back I could easily read my instruments from the inside of the cabin. The roof consisted of seven stout spars, covered with a carpet. From one of them was suspended by a wire an exceedingly primitive "chandelier."

On the after-deck the Cossacks built for themselves a similar cabin of felts and planks, and packed it all round with their own things, such as their travelling-trunks, beds, and clothes. Here Sirkin had his own little work table, with his aneroids, a watch, his thermometers, the velocity instrument, measuring tape and writing materials; and all the way to Abdall he acted as my amanuensis.

As soon as the Cossacks had finished their work of re-constructing the ferry-boat, I gave them a new problem to solve. My friends, the Lop fishermen and canoemen, had with one voice declared it was impossible to travel by water in the teeth of the wind without the help of paddles or oars. I was therefore tempted to astonish them, and at the same time put before them a convincing proof of the correctness of my assertion to the contrary. Accordingly I carved a tiny model, and with that to guide them, the Cossacks hewed out of a poplar tree a sailing canoe, the hull of which was shaped with mathematical exactitude. I could not use my English skiff for the purpose, because tacking was just the one thing she would not do. Along the bottom of the new craft we fastened a false-keel, by means of iron clamps, and underneath that hung two or three bars of iron which had been bought in Shar-yar for a totally different purpose. Then we covered her with skins stretched as taut as a drum. A mast, which could be put up and taken down at pleasure, was fixed in crutches in the fore part of the boat, and she was rigged with a fore and aft sail. Our smith made a first-rate rudder, and swung it on a stern-post in such a way that it was movable between two thole-pins. To make the boat ride more steadily we fastened two bags of sand in her bottom. At the most she would only carry one man, and was so narrow that the "yachtsman" scarcely had room to sit behind; indeed, he was obliged to balance himself as best he could with his legs propped on the rail.

The natives sat and watched our proceedings with the greatest interest and curiosity, and when the boat was ready and tried in a hard wind in an expansion of the river, they were loud in their exclamations of amazement. She tacked easily, and readily obeyed the helm; but she was not a particularly dry craft, for

she generally had her rail under water, so that to navigate her was pretty much like sitting in a bath.

On the evening of the 17th May all the Mussulmans paid a visit to Parpi Bai's grave to recite prayers by way of farewell to their old comrade. After that the inhabitants of the neighbourhood were called together, and all who had served as hewers of wood and drawers of water, as purveyors of hay, as shepherds, or in any other capacity, were duly paid and settled with.

Next morning when I stepped outside my cabin, there stood the nine camels waiting for their loads, which were already made up and lashed upon the pack-saddles. I had originally intended to send them on by night, in order that they might escape the gad-flies, which torment the poor beasts horribly, especially when they have just shed their hair, as ours had recently done; for they are then almost naked and exceedingly sensitive, looking like fledgling crows, with a tuft of hair on their heads and two or three tufts on their humps. But as they had had a long rest, and would probably be playful and sportive at starting, we thought it best to let them travel the first two or three stages by daylight, and afterwards, as soon as they had sobered down, to continue by night. The caravan was led by Islam Bai, Turdu Bai, Khodai Kullu, and two Lop-men; and Chernoff was commissioned to escort them to the mountains. The dogs Mashka, Yolldash, and the two pups, Malenki and Malchik, which had thriven famously, were all tied up to prevent them from going along with the caravan. These, being my especial favourites, I wanted with me for company on the ferry-boat. All the other dogs accompanied the caravan, and Yollbars, who had got badly torn in the side by a wild boar, was allowed to please himself. He lay in my old hut and licked his wound until it healed. Later on he went with me when I attempted to get into Lassa.

The camels with their towering loads, and the men with their parti-coloured attire, made a taking picture, as, surrounded by a crowd of spectators, and followed by mounted Lop-men and begs, they defiled through the reeds and bushes.

As soon as the camels' bells had died away, I, Sirkin, Ördek, and two or three boatmen set off in two canoes to explore Göllmeh-ketti, or the Lake of the Lost Fishing-net. Whilst we were sounding it the wind increased to a half gale, and clouds of dust and sand brought on a premature twilight. The dust-clouds hung down from the crests of the sand-dunes like tassels, and the

waves broke over our canoes. We hurriedly dragged them ashore, baled them out, and resumed our journey. Owing to the shallowness of the lake we were forced to keep a good way out from shore, but then the waves beat in over the low rail and drenched us to the skin. All at once down went Sirkin's boat. Out jumped the men. A little later we saw them philosophically hauling their craft up on dry ground and wringing the water out of their clothes. Ere long we in the other canoe were in a very similar plight; for our light canoe was tossed about like a nut-shell. At length she shipped so much water that it became only a question of time when we should go down. Accordingly we turned

Children on the Bank of the Tarim.

before the wind and ran ashore in shallow water with a sandy bottom, where we waded out without getting wet above the waist. Then, taking off our clothes, we spread them and our other things out on the sand to dry, for it was still warm from the sun. The men lay down and slept; but I remained awake, watching for an improvement in the weather. As, however, the storm did not abate, and we had brought no provisions with us, and as, besides, it was imperative that I should get back to the ferry-boat in order to wind up my chronometers, I directed two of the boatmen to paddle the canoes close in beside the shore, and continued my mapping on foot.

During the night the wind blew so hard from the south-east, that the ferry-boat was almost careened as she hung at her

moorings; for, guided by a fire which Shagdur made, we successfully found our way home, though the last part of the trip was in pitch darkness. During the past few days the river had risen a few inches. The natives told me that in addition to the great spring flood, caused by the melting of the ice, the river rises again, though not so high, at a subsequent period of the year, namely, when the *Elæagnus* bursts into flower and the young wild geese begin to leave their mothers. These fluctuations are probably connected with the distribution of the atmospheric pressure. So far as we were concerned, every addition to the volume of the stream was welcome; this, on the 16th of May, measured 2,592½ cubic feet, or about 790 cubic feet less than on the 7th of May. Once the great flood is past, the river falls with extraordinary rapidity. There was consequently no time to be lost. Hence on the 19th I bade the men cast off. My new boatmen, Ak Käsha, Sadik, Tokta Ahun, and Atta Kellghen looked decent, reliable men. One Loplik navigated my English skiff. The little sailing boat and the big canoe were lashed together, and put in the charge of another Loplik; but we gave the smaller commissariat boat, which we had brought from Lailik, and our other canoes, to the inhabitants of Yanghi-köll. The *kemi-bashi*, or "ship's captain," of the bigger ferry-boat was Ördek, while old Aksakal Pavan, who begged that he might go with us, was stationed just in front of my writing table.

The women of the neighbourhood gathered in our abandoned huts, and peeped out at us between the sheaves of reeds, and as soon as our ferry-boat got well started, the men accompanied us some distance along the bank, until at length they dropped away one by one, and returned their several ways home. They would certainly miss the bustle of our camp.

The whole of the first day, during which we were retarded by contrary wind, the river hugged the high sand-dunes. My object in this new expedition was to map the lower course of the Tarim, and as many of its lateral lakes as I possibly could manage. But although this would make my third itinerary in that region, the only points at which it would come in contact with the first two were Arghan, Shirgeh-chappgan, and Abdall. At Yanghi-köll there had been disturbing rumours rife with regard to the river. It was said to be deflecting into some new arms situated farther to the east, and there was also said to be scarcely water enough left to float our ferry-boat to the termination of the Tarim. But, whether or no, I was

determined I would not abandon her until I was absolutely forced to do so.

On the 20th of May, with the same crew of boatmen as before, I made a trip to the Karunalik-köll, which turned out in every respect successful, the weather being splendid. I was consequently enabled to take my soundings along systematic lines, zigzagging backwards and forwards across the lake, and in this

Women and Children Looking on with Curiosity.

way obtained more than sufficient material for drawing out bathymetrical curves. In the very entrance to the lake I made one interesting observation, namely, that the lake drew off from the river 81¼ cubic feet of water per second, that is to say, the latter was drained by this one lake alone of over 7,000,000 cubic feet in the twenty-four hours. This will convey some idea of the vast quantity of water which is lost in the Tarim system by evaporation and absorption in the sand. The muddy river water spread out fan-like over the surface of the lake, for its own water was of an emerald green or ultramarine blue colour, although

nothing like so pure or so intensely blue as the blue of the glacier lakes in the mountains.

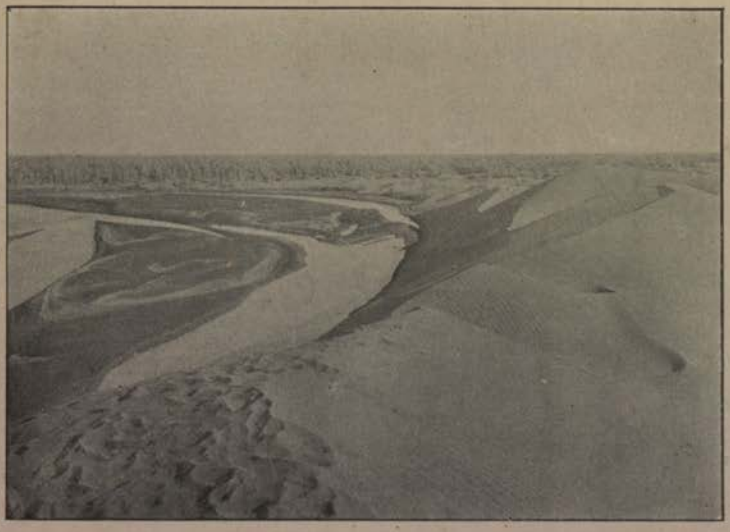
The Lake of Karunalik-köll consisted of two elliptical basins. shaped like the figure **8**, a formation very common in these peculiar desert lakes, as well as in the dry-land bayirs. Thus the same common designations occurred in them all, *e.g.*, *bolta*, the strait or narrow channel which connected the two basins; *kakkmar* or little bays, lying beside the *mojuks* or projecting capes and headlands. Their deepest depressions occurred, as they do in the bayirs, immediately at the foot of the steep dunes on the eastern side. Thus most, if not all, of the poplars stood on that same side, and very often were so smothered in sand that it was a wonder they were not killed by it. But their doom was anyway sealed; for the dunes were being driven steadily and unceasingly westwards by the easterly gales. Tamarisks and *Elæagnus* occurred but seldom. Reeds grew almost everywhere along the western shore, though only on the dry land.

Measured by the levelling-mirror, the crest of the highest dune beside the lake was 293½ feet above the water; but at the same time I perceived several other points 30 to 50 feet higher still. Thus the sand-dunes on the right bank of the Tarim reached in this locality an altitude of over 300 feet. The loftiest summit which I measured went steeply down on the west to the next depression, which belonged to the Tograklik-köll and its bayirs. These, like the string of bayirs which we followed when we crossed the desert to Tatran and Cherchen, appeared to stretch towards the interior of the desert.

In the afternoon we continued down the river as far as the entrance to Ullug-köll or the Big Lake, and there encamped. The *acha*, or channel, by which the river water entered it, carried 236½ cubic feet in the second. The reeds along the shore showed plainly that during the last autumn flood the lake had risen 4½ feet higher than it stood at the time of our visit. That is to say, the lake had then been considerably bigger. Its waters were abundantly stocked with fish; but regular fishing would not be carried on until the river fell low enough to allow of the lake being cut off. Here the fishermen did not hang their nets in the chappgans, as they did in the reed-grown lakes. A drag-net of some 60 fathoms in length was drawn along the shallow parts by two canoes. First it was stretched out into a semicircle; then one of the boats turned inwards, making a sharp loop with the net; after which the other boatmen drove the fish into the loop

by beating the water with their paddles. That done they hauled in the net, and killed the fish with a blow from a club. Fishing cannot of course be carried on in this way when the wind blows, for the canoes then drift too much. The fauna round the shores of Ullug-köll was represented by deer and wild boar, though the latter only visited the locality occasionally. Sirkin shot a male which was on its way to the river. The only birds we saw were eagles, terns, and a few small waders. There was no food for wild duck or wild geese.

The whole of this series of lakes, which hang like leaves on a stalk along the right bank of the Tarim, are parasites or out-



Sand-dunes on the Right Bank of the Tarim.

growths upon the river, in that they derive their vitality from it, and would die if it were to flow in some other direction. By the autumn they are half empty, and have to be filled anew. Thus every year the river is drained of enormous quantities of water, which but for these lakes would find its way into the Kara-koshun. It is not difficult, therefore, to conceive that at a time when as yet they did not exist, the Lop lakes were much more extensive than they are at the present day, and that their origination and expansion are one of the causes of the gradual disappearance of the lakes lower down.

Life on board was as peaceful and quiet as it had been during our long autumn drift down the Tarim. The Cossacks enjoyed

themselves thoroughly. They sat outside their cabin and talked; they circled around the ferry-boat in their canoes; they rowed to shore and shot wild-duck in the quiet angles of the stream; and when their day's work was done they amused themselves with fishing. In fact, we lived almost entirely upon wild-duck and fish, although we were able to procure mutton and milk from the shepherds on the banks. Shagdur was my cook and *valet de chambre*. Ördek, our skipper, was rather noisy in issuing his orders, otherwise he managed first-rate. When we stopped for the night the Cossacks slept on board with me, but the Mussulmans always slept on shore. Every afternoon I had the two pups bathed, a performance which afforded immense amusement to the onlookers, though it was an abomination to the little wretches themselves.

On the 23rd of May we did an unusually long stage. In the afternoon, just as were about to measure the velocity, etc., Naser Beg, Kirgui Pavan, Shirdak Pavan, and Temir-shang-ya came paddling down the river in their canoes. The last-named was sent about his business at once, for he was an arrant rogue. Not only had he, by means of his own specially-trained ruffians, stolen some cloth and other wares from Khalmet. Aksakal, but he oppressed the people in his district. In fact, in spite of his entreaties to the contrary, I reported him to the amban of Charkhlik, who deprived him of his office and his rank.

Perhaps I shall not seem presumptuous if I add here that so long as we dwelt in the Lop country peace and good order prevailed, for I would tolerate no injustice or wrong to its poor, but honest inhabitants. Hence all who suffered from any wrong, and lacked the means or power to get themselves righted, used to come to me with petitions for help and redress. In this way Tura-sallgan-uy became famous as a court of justice, and so in a sense acquired the position of capital of the country, sometimes, to the prejudice, I am afraid, of the Chinese ambans of Dural, Kara-shahr, and Charkhlik. In the more serious cases I used to write to these gentlemen and remind them that if they failed to carry out my behests it might be the worse for them. Smaller affairs we used to settle ourselves. The fact is, the people of the Lop country suffer far more from their begs and ambans than they do from the gnats and gad-flies.

We now engaged a flotilla of nine canoes to clear a passage for us through the intricate net-work of new-formed lakes, choked with

Setting Fire to the Reeds.

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kamish, which began at Keppek-uy. The lakes of Kurban-jayiri and Syssyk-köll, we crossed without any trouble, thanks to the wind which helped us along, and to our men, who, exchanging their punting-poles for paddles, paddled the ferry-boat across what was fairly open water. But on the other side of this we again steered into a tunnel, where the reeds fenced us in on each side like a hedge, 13 feet high. Here we were nearly stuck fast altogether, the ferry-boat being for some time unable either to advance or to retire. We began to fear that this was the end of her journeyings. As long, however, as we stuck there, we had one thing to comfort us: we were in the shade, and it was cool. On the other hand, the gad-flies (*kökkön*), of which the air was full, were a perfect curse. My ears were assailed with their never-ceasing buzzing. Down they banged upon my map-sheet; they made themselves impudently familiar, they tormented me like imps of evil. I could, of course, have protected myself with a mosquito-net; but I was really ashamed to use it, when the men, who were half naked in the water, never uttered a word of complaint. At sunset our tormentors disappeared, but their place was instantly taken by midges and mosquitos. At that season of the year in the Lop country you cannot obtain a single moment's peace throughout the whole round of the twenty-four hours.

It was no easy matter to get out into the lake of Tuvadaku-köll, for the passage was fully 6 feet too narrow, as well as shallow and crooked; and unfortunately this was the only way there was. It took a score of men working fully two hours to deepen the channel and hew down the reeds at the sides, and even then we were only able to move the ferry-boat slowly along, foot by foot. Time after time, with the view of lightening our labours, we set fire to the reeds, until the lake became edged with living pillars of fire, which volleyed forth dense columns of smoke. However, this method could only be employed on the sheltered side, for it was not unattended with danger to our own inflammable craft; had her top-hamper caught, it would have burned like tinder. But at last, after a heavy day's work, we dropped anchor at the little island of Yekkenlik, situated in the middle of the lake of the same name.

On the other hand, the excursion which we made on the 25th May to Beglik-köll turned out an exceedingly lively trip. Although during the night the thermometer did not fall below 16°.0 C. or 60°.8 Fahr., the morning felt quite fresh. It is astonishing how the body accommodates itself to changes of temperature.

I have known it feel comparatively warm with the thermometer standing as low as −10°.0 C. or 14°.0 Fahr. The Beglik-köll was so peaceful and still it was hardly possible to believe that it could be whitened with hissing waves. The sun burnt fiercely, especially during the three hours we were travelling due south. The only way I could keep myself tolerably cool was by sprinkling water over my white clothes. We spent the whole day on this lake, simply measuring two or three of its bays. One of these I mapped from the top of a sand-dune, whence I obtained a bird's-eye view of it. The sand was burning hot; I could feel it through my shoe-soles. How refreshing, then, to sit afterwards with my feet hanging over the side of the canoe, whilst I enjoyed a smoke.

But my enjoyment was short-lived. My old friend, Kirgui Pavan, called also Kurban, pointed to the summits of the lofty dunes on the east of the lake, and ejaculated in a questioning tone, "*Kara-buran?*" (black tempest) A dark pillar was rising above the horizon and leaning over in our direction, and it was crowned by a capital of lighter cloud. Gradually other similar pillars mounted upwards on each side of the first one, until they made a long row, resembling gigantic hands with the fingers upstretched. Then they slowly drew nearer one another, melted together, formed one continuous wall with a serrated upper edge, and all the time still kept on mounting higher and higher. There could no longer be any doubt as to what was impending.

After weighing the situation, the Lop-men voted for staying where we were. But that course I could not agree to; not because we were short of provisions, nor because it was disagreeable to lose the comfort of my cabin, but solely because the chronometers must be wound up at the usual time. Kirgui Pavan thought it would be anything but pleasant to await the tempest on the west side of the lake, because that was the exposed quarter. Now Kirgui Pavan was a very cautious and prudent man; he did not know what fear was, and in moments of real danger never lost his head. After studying the position for a second or two, he proposed that we should seek shelter in the throat of the narrow channel which supplied the Beglik-köll with water, and which it had taken us two solid good hours in the morning to wind through. But to reach it we should have to traverse the greater part of the lake, crossing on the way the open end of a broad bay which penetrated the sand on its west side. The best plan would have been to cross straight over to the eastern side at once, where we should have been sheltered by the sand-dunes; but, although the lake was

still scarcely ruffled, all the men without exception were against such a course. The distance was too great ; we could not possibly get across before the tempest burst. There was consequently only one thing to be done : we must cross the mouth of the bay and creep along the northern shore of the lake, getting the best shelter we could amongst its small islands and holms.

The men plied their paddles with such energy that every moment I expected to hear them snap. The blades bent like bows, and the water foamed high off the bows of the canoes. We went at a terrific pace, close upon 5½ miles an hour. The men were in a panic of fear, and continually ejaculated in hollow,

The Ferry-boat Fast in the Reeds of Tuvadaku-köll.

awe-inspiring tones: "Ya Allah ! Ya Allah !" The atmosphere was still serene, but there was an unmistakable feeling in the air that we were on the eve of a convulsion of nature, and the tempest advanced rapidly.

"Now it's on the top of the dunes !" cried Kirgui Pavan. Even whilst he was actually speaking their crests became blotted out as though they had been rubbed off a slate. A moment later and their flanks were gone : then the shore-line was engulfed in the thick, greyish-yellow haze. "Row, children, row ! There is a God above !" cried the old man, encouraging the paddlers. "Khodaim var" (There is a God above) ! was his invariable war-cry in all critical moments of excitement or danger.

Down came the first gusts of wind from the east-north-east. We heard the swi—i—i—ish of the tempest as it swooped down upon the lake. Up flew the water, hissing and foaming, and in less than a moment the surface was all aboil with big black pitching breakers. The nearer the tempest advanced the harder the men paddled, until I verily believe we were travelling nothing short of six miles an hour. But there still remained nearly 1¼ miles to the northern shore. "We shan't do it!" cried the men. "Ya Allah!"

I put into my pockets the few instruments we had with us. I took off my shoes and socks, so as to be ready for the worst. "Here it comes!" cried our canoemen, and they tried to paddle still harder. Every man was on his knees, and the paddle-strokes followed one another so fast they seemed to be driven by steam. Just as the tempest was upon us, and our light craft would to a dead certainty have been capsized had we not tilted them to windward, we became enveloped in the dense fog of dust. The western shore was now hidden from us as well as the northern. The seriousness of the situation forced itself home upon us when we saw nothing but hungry waves all around us and the canoes dancing away into the fog like floating straws. But Kirgui Pavan and his canoemen were equal to the occasion; every time a high "curler" threatened to engulf us they switched the canoes a little into the wind, and so kept out the greater part of its breaking crest, though we all got drenched to the skin as the spray drifted over us.

At length we caught a glimpse of the tamarisks on the northern shore, looking like black blotches in the fog. Then a minute or so later we got under the shelter of a long, narrow tongue of land which served as an excellent breakwater. But we only just reached safety in the nick of time; a few minutes more and the canoes would have sunk.

Sirkin and Naser Beg, having become very uneasy on our account, the latter set off from Yekkenlik for the Beglik-köll with two big canoes to assist us. We met him and his flotilla near the entrance to the channel I have spoken of. He brought with him beds, warm clothes, and provisions, a complete outfit, in fact, which Sirkin had sent in case we should not be able to get back before evening. A capsize in mid-lake in such weather as that when it would be quite impossible to see where to swim to, could hardly fail to be attended with some fatality, although all except Shagdur were good swimmers. But the floating power of a Lop

On the Beglik-köll in a Sandstorm.

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canoe is insignificant, especially when once it gets full of water. My instruments would, of course, have been utterly ruined.

It was no easy matter to find our ferry-boat amongst the rank reeds of the lake of Yekkenlik-köll. It was pitch-dark when we entered it, and the tempest was just about at its climax. We literally saw nothing, though we felt very sensibly when the buran beat the reeds across the canoes and whipped them into our faces. I had to keep my arms up over my face the whole way, or it would have been cut to pieces by those long, sharp, ribbon-like blades. It was no use shouting out warnings; all sounds were swallowed up in the shrill howling of the wind through the kamish. How the canoemen found their way I do not know, but at last we caught a glimpse of the fire which Sirkin had lighted to guide us. We were, however, quite close to it before ever we saw it, for, although the flames were fanned to a white heat by the tempest, they were unable to penetrate the fog. The ferry-boat and other boats being securely moored both fore and aft, we were quite safe.

This was one of the most awful storms I have ever been out in. We did not get much sleep that night. A couple of the felts on the fore-cabin were torn loose and had to be fastened down with ropes and poles, and I had to bring the meteorological observatory in under shelter. All small, light articles which were lying about the cabins began to whirl about, and had to be picked up and put safely away. The sand and dust rained in through the felts, and penetrated at every orifice. But I was most concerned about the fire, for the ferry-boat was surrounded by reeds on every side. To guard against this danger, I appointed a man to keep watch all night, both on board and on shore.

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CHAPTER XXVI.

FLOATING DOWN THE TARIM BY NIGHT.

THE tempest raged the whole of the following day, keeping us prisoners at Yekkenlik. But towards evening it abated somewhat, and gave me an opportunity for a splendid sail across the lake in my new boat. The gnats and gadflies disappeared when the storm came; but on the 27th May, when it was again still and warm, they crept out of their hiding-places in myriads. On that day we traversed the remaining portion of the Yekkenlik-köll, until we reached the point where it discharged itself over cascades into the Tarim. Here a flotilla of 12 boats, manned by 30 men, met us, to help us over the rapids. Holding the big ferry-boat by ropes at both ends, we let her down gradually by working her from the shore, for the water in the middle of the cascades was broken and tumultuous, and so continued for some distance below. Step by step the big leviathan dropped from sill to sill, her fore part advancing until it was lifted by the tossing crests below. Everybody was greatly excited, and the men shouted deafeningly. But we steered her over quite safely, and then on she went again, calmly floating down the Tarim.

This part of the river, which carried only 547½ cubic feet of water in the second, was on the point of dwindling away, having been superseded by a new river-arm, the Lashin-daria, which branched off into the eastern lakes. The following day I dismissed all the men I no longer wanted, Naser Beg at their head, and thus, with a greatly diminished complement, our flotilla slowly drifted down the river. The weather was splendid. During the preceding night the thermometer dropped to 6°.9 C. or 44°.4 Fahr. and the insects were not so troublesome as usual.

At this period the day's routine was as follows. At daybreak I was called by Shagdur. Then I started to inspect the

camp, greeting the Cossacks with a "Good morning, Cossacks!" which they answered with a salute and "Starovieh shelayim vasheh prevoshoditelstvo!" (We wish your Excellency (!) good health!) To the Mussulmans I gave the usual "Salaam aleikum!" (Peace be with you), and like an echo the phrase was repeated by each of them in turn. Next came breakfast, which consisted of fish, eggs, bread, and tea. During the day the tea-pot generally stood in my cabin, and the samovar was 'always kept warm in the Cossacks'. We had dinner at eight o'clock; it generally consisted of rice pudding (ash), fish, coffee, and milk. We worked all day so long as it was light, and the evenings were devoted to the writing up of notes and observations.

Shagdur answered excellently well; I became more and more attached to him and gave him my confidence. He had already learnt to speak fluently with the Mussulmans, and of his own accord persuaded Sirkin to give him lessons in taking the meteorological observations, as well as lessons in reading and writing Russian; and before our travels were over, he had made such progress that, on several occasions when we were separated, he was able to write me reports and letters in Russian. Had the Cossacks not been naturally men of good character, they would, I fear, have been spoilt during the time they were with me, for they enjoyed a very considerable amount of liberty. But their discipline never slackened for one moment, and they never forgot the respect they owed to their new chief.

The best of the Mussulmans was Kirgui Pavan, the camel-hunter of Tikkenlik, an old man of seventy, thoroughly upright and honest; it was quite a pleasure to have such a man about one. His place was at the fore, in front of my writing-table, where he looked after the starboard punting-pole; while Aksakal, of Yanghi-köll, a big, strong, white-bearded old man of sixty, looked after the punting-pole on the other side. I quite enjoyed listening to these two old worthies as they talked about the prospects of the voyage, and the gradually growing distance which separated them from their homes in the north-west. They wondered how in the world they would ever get back there; and several times I had to comfort them by promising that I would undertake to see them home again. Kirgui Pavan knew the river well, and it was a great advantage being able to ask him, every time I began a fresh sheet of my map, which way the current turned next; otherwise I should sometimes have run over the edge shortly after beginning it.

Ördek, who had proved himself such an excellent fellow, reported himself sick, and was sent home in a canoe. As soon as it was dark we moored the ferry-boat. I had had my dinner, and was busy with my diary, when the dogs began to bark, and a strange canoe came paddling through the darkness and pulled up alongside. I thought it was a Loplik come to pay me a visit; then I heard quick steps along the passage outside. The felt curtains were pulled apart, and behold there stood the well-known figure of Musa, the jighit. He had ridden from Kashgar, a 33 days' ride, with my letters, and finding the camp at Yanghi-köll empty and deserted had taken a canoe and followed us down the river. The arrival of a jighit, or courier, was always a red-letter day, for it again brought me into touch with home and the outer world. After the letters, books, and newspapers were stacked up on the floor, I closed the cabin, and lay and read till three o'clock the following morning.

My old pilot, Kirgui Pavan, told me as usual the names of all the outstanding geographical features, and all he knew about the river and its history. In connection with a lonely poplar standing on a hill, which he called Kamshuk-tyshken-tograk, or the "Poplar where the Kamshuks settled," he told me a strange story about a people of unknown nationality, who several *decennia* ago came from Korla, and floated down the Kontcheh-daria on rough rafts made out of poplar trees. They consisted of 50 families, with women and children, but relatively few old people, and travelled slowly, resting at intervals for two or three days at a time. They were very poor, dependent in fact on what they shot for the necessaries of life. Kirgui Pavan had himself seen them when he was young. He recollected that they were clever shots, and lived a good deal on fish and the flesh of the wild boar. Their leader was called Yiven (Ivan?), and had previously visited the country alone, for the purpose of inquiring whether it was suitable for colonising. Their manner of killing sheep was different from that of the Mussulmans; for they first stupefied the animal by striking it on the head with a club. One of the older men amongst them was called by the Lop-men Yeghalaghak, or "the Weeper." His wife died and was buried underneath the poplar just mentioned. After spending three years in the Lop country, where they penetrated as far south as Charkhlik, they were, by command of Ashur Beg of Turfan, driven back the same way they came. Travelling back by land, they were one dark night overtaken by a buran, during

which a beautiful young girl, who was betrothed to a man named Everani, disappeared. The latter almost went out of his mind with grief, and spent several nights and days searching for his *fiancée*; but as she had evidently lost her way during the storm, her people were forced to abandon her to her fate. They all spoke fluent Turki, and described themselves as fugitives. This disconnected and fragmentary story was the only tradition about the Raskolnikis that I heard in the Lop country.*

On the afternoon of the 29th of May, the river again turned capricious and unsettled, dividing into several arms, amongst which we had to choose with the greatest possible care, and finally we encamped for the night beside a little island in the new lake of Sattovaldi-köll, the only spot of dry land which was visible. Here the gnats were more troublesome than usual, for the nights we spent amongst these reed-grown lakes were much more stifling than those passed on the open river bank.

The next day our route lay continuously through lakes and a labyrinth of narrow canals, which we couldn ever have threaded without the help of a native levy. However, at nightfall we once more encamped beside the Tarim, which had a volume of 840½ cubic feet in the second. But the river was becoming uncomfortably sinuous, and the wind, too, was against us. Paddling and punting made but little difference, so that it was the evening of the 2nd June before we reached Ayag-arghan, and pitched our camp on the same headland on which we had tented twice before. There we stayed two days. Whilst the Mussulmans thoroughly cleaned the ferry-boat, I measured the two rivers which at Arghan issued from the Chivillik-köll, and entered the Tarim. Their united capacity was 1,289 cubic feet in the second. Hence for yet a few more days there would be no occasion to complain of lack of water. The main stream, which from this point also bore the name of Baba Tarim, or Old Father Tarim, carried 2,147½ cubic feet in the second.

The stretch of river which we travelled over on the 5th June was winding and full of sharp turns, and took us between luxuriant forests, now in the full beauty of their summer foliage. The water was warmed up to 23°.5 C. or 74°.3 Fahr., and Sirkin often used to slip over the side and have a swim. For my own part, I only bathed at midnight and at 7 o'clock in the morning. But I always had a big tub of water standing in my cabin, so

* But see pp. 309-310 above.

that I might cool myself in the intervals between the taking of the compass-readings. The Cossacks, setting their nets every evening, kept us well supplied with fish. One morning the catch amounted to a score, each fish being big enough to satisfy a hungry man at a single meal.

The farther we advanced down the Tarim, the more the gad-flies, gnats, and mosquitos multiplied in number, and as they were fond of confederating together, there was not much pleasure to be got out of life. They were excessively social, and vied with one another in their attentions. It was no use fighting against them, we only got worsted. The gad-fly's bite left a burning sting behind it; and every morning the "varmints" generally lay so thick round my writing-table that I had to order one of the men to come in and literally sweep them away. The dogs waged desperate war against them, but the only time they obtained a truce was at night. Kirgui Pavan maintained that the incredible multitudes of insects in this particular locality were directly connected with the absence of other animal life. As a rule, all the huts we passed were uninhabited, nor were there any shepherds either: their flocks would have been destroyed by the gad-flies. Nor did we see any deer or wild boar. In fact the entire country was rendered absolutely uninhabitable by the insect plague. Merchants who have occasion to travel at this season of the year from Charkhlik to Korla only ride by night, and hide their horses or camels in the kamish huts during the day.

After stopping at Kyiyish for supper and to measure the river, we were off again at ten o'clock, and went on for about two hours by moonlight. But after the moon set it was pitch dark, except for the Chinese lantern that swung aloft on a pole on the pilot canoe. The night was perfectly still and peaceful; not a sound was audible, not a breath moved. The gad-flies had long ago crept amongst the grass and reeds to sleep. Every now and again a fish splashed softly on the surface, and occasionally we heard the water gently rippling against a reed-stalk.

The Cossacks sat on the "bridge" smoking, and started the musical-box, to keep the old men awake, as they said; though this was an unnecessary precaution, for, as a matter of fact, they were both apprehensive of coming into collision with some overhanging poplar or of running aground. Sirkin had lighted a big flaring naphtha lamp, which lit up the banks, so that he and Shagdur were able to tell me from time to time what they were

like; for instance, "on the right, thick forest close to the water's edge;" "on the left, kamish fields, bushes, young forest, etc." The compass-bearings I took from the light in the pilot canoe.

Thus we glided down the never-ending river in the silence of the night. I whistled as I worked to the old well-known tunes of the musical box, while the Cossacks puffed away at their short clay pipes. At intervals, when old Kirgui Pavan considered a little extra care or vigilance was called for, he used to cry out "Khabardar!" (look-out) We were now rapidly approaching the grave of the mighty river, and a feeling of melancholy began to steal over me, as I saw one loop after another disappearing behind us.

When the novelty of the music had worn off, the men grew drowsy and sleepy. The musical-box stopped; the lamp went out. Sirkin nudged Aksakal, whose head was drooping with a suspicious nod, but was himself, a little while afterwards, caught with his back against the bulwark, his nose tilted skywards, and his mouth wide open, snoring his hardest. His cap slipped off his head, and was dropping into the river, but he just managed to catch it in time; then for a little while he was as lively as a squirrel. At two o'clock I took compassion on the poor fellows, for of course they had not the same interests to keep them awake as I had. We moored the ferry-boat to the bank, and in less than five minutes dead silence reigned on board.

But before we had slept very long another buran burst upon us, and rent open the felts of my cabin. All the next day the tempest still raged, and prevented us from starting until ten o'clock at night, when it abated a little. Then we did three hours. On the 8th and 9th of June we were again detained by a furious gale from the east-north-east. Most opportunely, as if to give me something to do during the enforced wait, another jighit arrived, and I at once surmised that he brought important news, for he was an extra courier, not one of those I had arranged for. Consul Petrovsky informed me that he had received a telegram from the governor-general of Turkestan, to the effect that, owing to the disturbed state of the outskirts of the Empire in Asia, the two Cossacks, Sirkin and Chernoff, were wanted, and must be sent back without delay to Kashgar. This was a blow both to me and to Sirkin. We discussed the intelligence for a long time, and assumed that serious disturbances had broken out somewhere on the Siberian frontier; for of what was at this time happening in China we had not the remotest idea.

I at once sent off an express messenger to the Chimen-tagh with a letter to Chernoff bidding him, without a moment's delay, return to Abdall. Sirkin had of course to wait for his comrade; they could not travel separately. Now that we were constrained to part in this unexpected manner, I was very glad I had written to the Emperor of Russia from Yanghi-köll, thanking him for sending me two such excellent men as these Cossacks, and telling him of the great services they had rendered me.

On the evening of the 9th June we were all very anxious about Shagdur, who went out hunting about five o'clock. At supper-time, nine o'clock, he was not back, so we kindled, at

A View of the Tarim at Shirgeh-chappgan.

different places along the bank, six big fires, which threw a lurid and picturesque glare upon the clouds of fine dust which still hung in the air. Still, however, Shagdur did not come. Then I sent off all the men, each in a different direction, with torches and lamps. I heard their shouts die away in the distance. I thought of the various dangers which might beset a lonely wanderer amongst those unearthly sand-dunes, of tigers, and of wild boars. It would have been hard to lose three out of my four Cossacks all at one blow. One after the other the searchers returned, but they came without Shagdur. However, about midnight Shagdur himself turned up, and told me that, having wounded a deer, which fled westwards into the desert, he had followed it for some hours; but when it grew dark and he turned back

he lost his own trail. Yet by keeping straight to the east, he at length struck the river and then wandered up and down it looking for us, until at last he caught sight of one of our fires.

Resuming our journey on the 10th of June, we skirted, on our left, a district called Tuga-ölldi, or the "Camel Died," a name which it derived from the fact that a camel belonging to a band of Mongol pilgrims died here whilst they were on their way to Lassa. For in Yakub Beg's time they used to keep to the left bank of the river, so as to be safe from molestation by his men. Thus an unimportant event, itself long since forgotten, is perpetuated for years in the geographical nomenclature of the

Women and Children at Chegghelik-uy.

country. Nowadays the Mongols always travel by the great caravan road, which follows the right bank of the river.

We stopped in the afternoon at Shirgeh-chappgan, to measure the river at the same point at which we measured it on the 18th of April. The volume now amounted to 2,412 cubic feet in the second; the river thus dropped very rapidly at this season of the year. After sending back the special jighit to Kashgar, we continued our voyage by night, piloted by several canoes carrying torches. And truly a wonderful procession it was which thus drifted, through the stillness of the June night, down the Tarim by torch-light, to the monotonous accompaniment of the canoe-men's plaintive love-songs.

I had already mapped the stretch from Shirgeh-chappgan to Chegghelik-uy in 1896; and when we passed Ak-köll, on the 11th of June, I found that the river had deserted the big loop which it used to make there, and had cut out a new channel across the narrow intervening neck of land. But the loop was still full of water, and a couple of steep and ragged headlands bore eloquent witness to the violence of the breach.

During the course of the day the forest came to an end, and the country on both sides opened out flat. The air was still, although still subdued to a kind of twilight after all the dust-storms. Then we perceived several canoes coming to meet us. In the first of them was Temir Beg of Chegghelik-uy. I invited him on board, and amongst other things he told me that it would be impossible to take our ferry-boat beyond his village, for the next lake, the Semillaku-köll, was entirely overgrown with reeds. Now, although I was longing to get up into the mountains, and the boatmen were impatient to return home, I could not help feeling rather sorry that this was to be the old boat's last stage. Towards evening we saw fires gleaming in the distance, and late that night we moored our faithful old craft for the last time to the left bank of the Tarim, immediately opposite to Chegghelik-uy.

Early the next morning I sent off Kirgui Pavan through the lakes to reconnoitre. He came back with the intelligence that it would be impossible to take the big ferry-boat any farther; and by way of confirmation brought with him a big bundle of kamish stalks, which showed by their length how deep the water was in the shallowest places. He thought, however, that 25 men could cut a navigable channel in a few days; but I rejected his proposal, because it would only take us three days to get to Abdall. But before starting on that stage, I wanted to use my dark-room once more for developing my plates; hence I decided to stay a few days at Chegghelik-uy, especially as in the meantime two or three canoes could be getting ready to take us to Abdall.

At this peaceful fishing-station we spent a very pleasant and restful week. We were encamped on the left bank of the river immediately opposite the village, and had a good view of its kamish huts and open stables, and saw how the cattle and horses and asses were tormented by the myriads of gad-flies. The little children ran about the bank naked and played amongst the canoes. As a background to this homely picture there was,

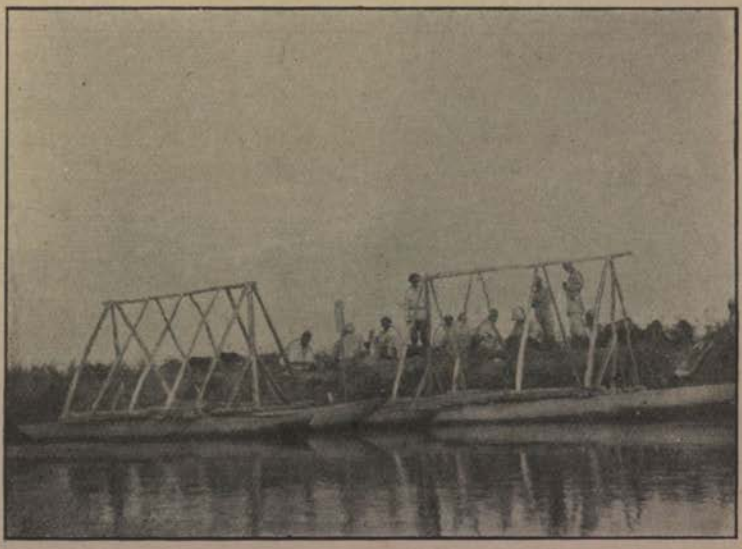
if one may so call it, a *memento mori* in the shape of the burial-place of the villagers, with its staves, and its fluttering streamers.

Every night I worked in the dark-room till four a.m., and Sirkin was my assistant, fetching me fresh water and drying the prints. During the whole of this week we were visited by uninterrupted storms from the north-east. After spending a whole spring exposed to these incessant burans, and witnessing what power they possess to mould and sculpture the earth's surface, I no longer wondered at the deserts, lakes, and rivers in this part of the world being subject to perpetual alteration.

A Stable at Chegghelik-uy.

We were obliged to paste paper all over the inside of the dark-room, to prevent the dust from penetrating in and spoiling our plates. As we worked the tempest howled and screeched outside. When we lay down to sleep the wailing of the wind and the splashing of the waves echoed in our ears; and when we awoke in the morning, the first things we heard were the same familiar sounds, and the first thing we saw was the same dust-laden atmosphere. But there was one advantage about this weather; it kept the gad-flies and mosquitos at a distance, and cooled the air delightfully. Before the storms began the temperature had twice risen above 40°.0 C., or 104°.0 Fahr., in the shade; but after they began, it was seldom more than 25°.0 C., or 77°.0 Fahr., and at night it even dropped to 9°.3 C., or 48°.7 Fahr., and 11°.0 C., or 51°.8 Fahr.

The Cossacks spent a good deal of time hunting and fishing, but otherwise had plenty to do in getting ready our new river craft, each of which consisted of three long canoes. First a flooring of planks was laid across them; upon the planks a framework of spars was erected, their upper ends meeting on a horizontal bar arranged parallel to the middle canoe; then the spars were covered with felts, making an oblong floating tent. After sunset on the 18th of June, as soon as I had finished my last dinner on board the big ferry-boat, she was given over to destruction. The cabins were taken to pieces, all the nails being preserved, and the felts were beaten to cleanse them from



Building the Tents on the Triple Canoes.

the loads of sand and dust which they had accumulated. My boxes were flitted over into my new floating "palace," which, as it was calculated to carry 26 men, was amply sufficient for me, my baggage, and the four boatmen it required to navigate it. We stowed away a portion of our provisions under the plank flooring; the rest were carried in separate canoes, which were to follow in our wake. I had of course less room than before, but my new apartment was very comfortable. The Cossacks lived in a similarly constructed vessel.

Before starting I dismissed Kirgui Pavan, Aksakal, and the other boatmen who had come with them. In the evening we had a joyous banquet in their honour, sheep being slaughtered

and rice-pudding cooked by the potful. In addition to their stipulated wages, I gave them a couple of canoes, and rations to last them all the way home; in return for which they, in accordance with the custom of their country, read prayers for my welfare. Next morning at sunrise when I stepped out of my laboratory, where I had been at work all night, there they all were in a row, reciting their morning prayers. Then they stepped into their canoes, said farewell, and set off for their distant abodes; whilst I went in to sleep.

It was like saying good-bye to a beloved home, to leave the old ferry-boat, which for all these months had rendered me

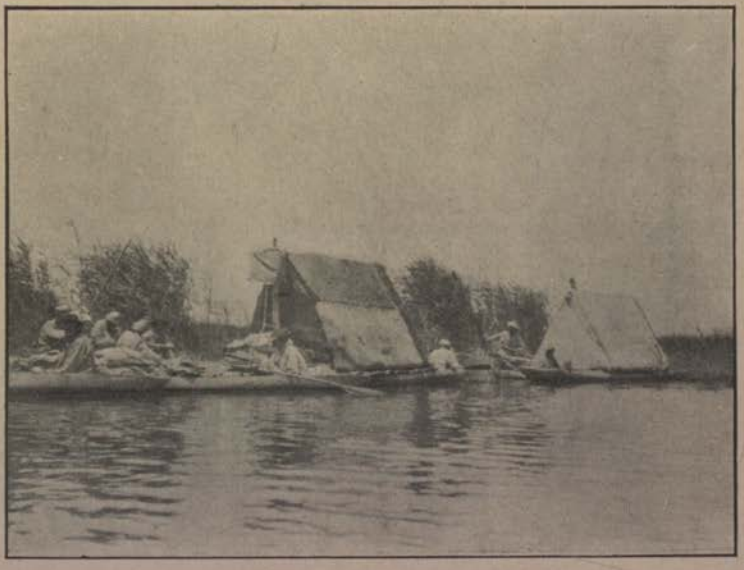
Ördek in the Reeds below Kum-chappgan.

such excellent service. I left her as a present to the inhabitants of Chegghelik-uy, who were enraptured with such a splendid means of transport, especially useful as it would be for carrying their live stock across the river, and for conveying over both caravans and merchandise. I learned afterwards, that by command of the amban, she was transferred to Arghan, where the main caravan road crossed the Tarim, and where there had previously been only a very dilapidated ferry-boat. Before we handed her over, Shagdur chopped my name in her side in large Roman letters, together with the date, 1899-1900.

It was midnight on the 19th of June when our new flotilla started from Chegghelik-uy, accompanied by a number of boat-

men and begs. We succeeded in crossing the lakes, and threading their narrow waterways without difficulty, though it would have been quite impossible to force them with the big ferry-boat. Next day we stopped at the mouth of the Cherchen-daria to take measurements. Although the river-bed was steeply scarped, deep, and full of water, it did not contribute to the lakes of Kara-koshun more than 141 cubic feet in the second. Except for a single small group of ten-year-old poplars, the country was perfectly open.

Our last day's journey on the Tarim was a short one. The wind blew from due east at the rate of 24½ miles an hour,



The Tented Canoes on the Way to Abdall.

and was fresh and splendidly cool. Although the boatmen received considerable assistance from the current, they were also compelled to ply their paddles well to make headway. The river was so ruffled, that the waves forced themselves in between the canoes, and splashed into them, so that we were obliged to stop to prevent them from filling.

At Abdall we were met by our old friends, Numet Beg and Tokta Ahun. The latter had accompanied both the horse caravan and the camel caravan to the Chimen-tagh, and reported that all was well in our new headquarters. The men also took with them up into the mountains the four camels which we left at Abdall the spring before, as well as my little

grey saddle-horse, and they were all now in good condition, and thoroughly rested. Whilst crossing the desert between Abdall and the foot of the mountains two horses had fallen, and all the dogs, including Taigun, had died of thirst. My men also drove up with them a flock of fifty sheep, to serve us for food during the summer. My courier with the letter for Chernoff had reached the camp long ago, and within a few days the Cossack ought to be at Abdall, with the small retinue which was to escort me to the mountains.

During our stay at Abdall we had good weather at first; that is to say, wind, which increased to as much as 42½ miles an hour.

A Sattma or Hut at Abdall.

This kept me, as it were, a prisoner in my own tent on board the canoes, where I spent all my time writing letters. It was a good opportunity to send them, together with my finished photographic plates, to Kashgar by the Cossacks. During a lull in the storm I made astronomical observations. One day whilst thus engaged, I was surprised to see a horseman riding towards the huts of Abdall, but soon recognised in him the Cossack Chernoff. He had started the moment he got my letter, and had performed the journey in a marvellously short time. During the last 35 hours he had not slept a wink, but was every bit as active and wide-awake as he always was. I invited him to go for a sail with me up the river in a brisk breeze, and whilst

we were out, he told me all about our new headquarters, which were to be the base of operations for the remainder of the year. He was very sorry at having to leave us just now, when we were about to begin a fresh chapter in my travels, and, after having looked forward to spending the summer in the mountains, did not at all relish the prospect of the long hot ride to Kashgar. Two or three days later Turdu Bai and Mollah Shah arrived with four camels and ten horses. Although they had only travelled by night since quitting the mountains, the camels' necks and legs were bleeding from the bites of the gad-flies, though the other parts of their bodies were protected by felt trappings. We gave the animals several days' rest, more especially the horses which the Cossacks intended to ride to Kashgar.

The weather now underwent a disagreeable change; the wind dropped and was followed by oppressive heat. We had to take the greatest possible care of the camels. With the view of protecting them from the swarms of gad-flies which literally blackened the air, I ordered a *sattma* to be specially cleared for them, thickened its walls with reeds, and bade two of the men stay beside them and ward off the pertinacious insects. At night, however, we let the poor beasts out to graze. One morning they were missing, and Turdu Bai, who knew the ways of his protégés, at once suspected that they were trying to run away from this horrid place. But the men went after them and fetched them back; for they were indeed returning to their companions in the mountains, where it was cooler, and there were no gad-flies to torment them. After that we gave them a bath in the river every evening, which they liked immensely. In this hot weather my tent on the canoes became unbearable; on midsummer morning it was like a Turkish bath. Outside it the air was filled with a never-ceasing murmurous hum, like a distant waterfall, and the moment I unfastened the flap, the tent became filled with gad-flies. I took my dip and dressed as fast as I could. Then, having moved the tented canoes over to the right bank, I ran as through a shower of bullets to Tokta Ahun's hut, which had been got ready for me. It was 10° cooler than in the tent, for the sun was unable to penetrate the thick bundles of reeds which formed its roof. To it I transferred all my boxes and carpets, my table and my bed. The dogs thought it a fine idea, and came and joined me; and they had a royal time catching gad-flies.

Meanwhile the days passed, and it was time to be on the

move again. We were only waiting for the next storm to deliver us from the gad-flies, for so long as the weather remained hot, we were literally besieged by these bloodthirsty insects. Once, indeed, we did try to make a start; but it wouldn't do. The camels flung themselves down on the ground in despair, and threw off their loads. I could not travel by night, because I should be unable to see to map the country. So I put off the moment of departure from day to day. As long as we remained where we were, we were well off. We had everything we wanted, and the people of Abdall could not do enough to serve us. We also had plenty to occupy our time. The Cossacks shot wild duck, and paddled about in their canoes. We measured the Old Tarim for the last time; its volume was 1,543½ cubic feet in the second. Thus in two and a half months the river had shrunk to less than half its size, and during the course of the summer it would dwindle still more.

CHAPTER XXVII.

THE POETRY OF THE LOPLIKS.

DURING these days I amused myself by jotting down some of the best-known songs which had been sung for a hundred years or more by the sons and daughters of the Lop country ; besides which, I also preserved some new ditties which were sung by the fishermen of Kara-koshun. They are simple, very simple and unsophisticated, these songs of the Lopliks, and bear witness to a restricted imagination and a naïve conception of life. But they prove that even these humble fisher-folk, who lead such monotonous lives in the heart of Asia, remote from the great caravan-roads and isolated from other races, are not without their love-poetry, and that they also, like men and women everywhere else throughout the world, are not insensible to the sweet impulses of the tender passion. These songs also furnish an indication of the limitations of their world of thought and knowledge. But, as usual, they lose a good deal in the translation, and sound immensely better in the original Turki, with its rugged, rhymed, and rhythmical cadences, sung to a monotonous tune twanged on the strings of a *dutara*. For my own part, I always enjoyed them : the melancholy note which runs like a red thread through both words and music well expresses the feelings of one who is lonely, and so paints his hopes in sharper relief. Here, then, are a few examples of this simple and homely poesy.

The first is a song which was sung by Jahan Beg, the father of old Kunchekkan Beg, and consequently is more than a hundred years old. The singer is a woman whose love has been despised :

" The spirits have created thee more beautiful than other men. When thou didst return to thy home, I would, had I had wings, have

Loplik Women and Children.

flown after thee like a wild goose, and have screamed as the wild goose screams. Thou knewest not, that I waited for thee the whole space of one year, and whilst that I was waiting loved not any other man. I have waited for thee long, thou my other half, and I beseech all who journey to thee to greet thee tenfold. Thou receivest all that pass thy way, and all that come to thee, and thou playest to them, and singest to them; but when thou playest and singest I, alas! am not there to hear thee. Thy feet must of a surety be bound; otherwise thou wouldest come to me. Thy name is known throughout Alti-shahr. Do thou as Yulduz Vang did: take thine ease, and let others work for thee. Since thou wilt not have me for thy wife, behold! I will come and be thy servant, and I will serve thee all I may. All my friends and companions counsel me to go to thee. For the space of a full year I have not smiled for thy sake, for thou hast spoken untruth. I have had no joy of thee. My tears have flowed like a river. It is God's will, that we should not be united. O how beautiful are thy eyes, and the long lashes, and the arched brows which shield them—none more beautiful!"

The following song, with its mingling of bitterness and pensiveness, dates from the same time. It is by a lover who has been rejected by his mistress:

"Since thou didst ride away, oh! how have I sighed after thy black eyebrows. If only I may, I will, ere this month run out, journey to thee, and play and sing with thee, and beat the drum Thou art still young, and thy father and mother have given thee to a good man. Oh! thou art crueller than the Devil, Mistress Sahib! Thou art hard-hearted! Thou cruel devil, thou understandest not my words! Thou art like the weather—now cloudy, now sunny. Thy father and thy mother loved thee well, and clothed thee in soft and delicate raiment. Let me—oh! let me know, when thy wedding shall be, that I may come and witness it! Thy mother were better than Imam Pattmah, and pure as nephrite. Imam Pattmah loveth thee. Whenas we all were young, we played together and were friends. Now thou swayest to and fro like the feathered plume of the *okkar* bird, and thy fame hath flown as on wings to Chimen. When the autumn cometh, and we journey to the Tarim, then shall our eyes meet. Fatherless and motherless art thou now; but we all shall give thee more than father or mother can give. When thou puttest on thy attire, lo! beautiful art thou as the glow-worm!"

Kunchekkan Beg's father-in-law used to sing the next song. It must consequently be eighty years old, although it is very

likely that it was by no means new in his day. The singer is a lover, who has not yet abandoned all hope :

"Sorely it grieveth me, that I took not my little sweetheart ; I shiver like an otter that is frozen. O what a lovely *khalat* (dress) is thine ; yet was I not strong enough to gain the same. And though I do not win thee to my wife, yet I shall go past thy dwelling and see thee. Very lovely is thy black hair ! Had I won thee, thy lovely hair would have rested on my breast ; but another won thee from

Eight Boys Sitting on a Canoe, at Chegghelik-uy.

me, and gave thee not to me. Had I known thou hadst the ring on thy finger, I would never have desired to know thee ; but I will come in the tenth month. When I come in the tenth month, I will ask how it is with thee, thou bewitching angel, thou that remainedst alone in thy empty dwelling. Thy breast is as white as the flame of a lamp ! When thou openest thy gown, lo ! one beholdeth thy snow-white breast ! The nails of thy fingers are like the day. Very warmly do I love thee, O thou that art like a star which wandereth in the track of the moon. When I prayed thee to abide awhile, then didst thou hasten away on thy swift-footed horse. Now that I am

become a beggar by the roadside, I cannot have thee, O thou loveliest amongst women; verily, thou art lovelier than the sun! O Assan! go thou to her, and tell her the words I have said: I will beseech the begs to give thee to me. When I beheld thy footprints beside the lake, I wept big tears, so that the sand on the lake-bottom was dimpled with them. Thou art like a princess: thou drinkest thy tea from vessels of silver. I crossed over to Yachi * to see thee, yet found naught but the empty dishes of thy feast. Since thou hast been denied to me, I have lived as one that is dead in the world. But now will I pray God, that I may live yet a year or two; then shall I mayhap win thee at the last. I have sent away my former wife. May God bid thee come to me. Thou walkest as light as the falcon flies; but thy husband hath not abandoned thee, and I am waiting without."

Here is a song from Arghan, about ten years old, and sung by a man who had got himself into a fix:

"As Tayir Khan and Suyah Khan both died in one night, so, in like manner, have we two not won one the other. Tayir Khan died in his mistress's village, before that he married her. Kara Bater smote him three times with the sword, and now cometh he never more. Though not sorely smitten, yet must his sins have been many, seeing that he died. Even as no man avenged Tayir Khan's death, so no man careth aught, that I have not won thee. Yet now that I have known thee, doubtless there will come one and slay me too. Since then I have taken me another wife, and they may do with thee whatsoever pleaseth them. Yet now do I grieve me, that I bade not the beg and Ahun, give thee to me instead. And yet methinketh, if God suffereth me not to die, no man shall ever avail to kill me. Truly it had been better to contend against all the village, and be slain, than have been saddled with her I now have to wife."

The next song is the song of Agacha Khan, a girl of Kumchappgan, who comforted herself thus:

"Hither hath my beloved come, and all things are fresh and green. It is time thou sowedst thy wheat, thou who now diggest the ground with thy spade. Did I but know the wild-duck's speech, I would ask him how thou farest. Thou camest hither, yet didst thou not look in upon me. Thou journeyedst home again, yet did Agacha Khan not journey with thee. She mounted into the saddle, and rode away with another husband."

* A village near the former lake of Kara-koshun.

Next comes a love-song of a hopeless swain, composed some years ago in Tuzun-chappgan :

" Thou art like the white spirit. I would I might sleep on thy bosom. When thou dancest to the music of an evening, how beautifully thy ribbons flutter around thee. I sit in my home, thou sittest in thine ; but I know that thou thinkest of me. Send me the falcon thou bearest on thy hand. When I lay me down to sleep, I may not sleep, so sorely do I think upon thee. Thy parents will not give thee to me ; but they will give thee to a beg from Turfan. Men say, thy parents will not give thee to me, because they are not pleased with me. So sorely do I long for thee, that my head spinneth round ; it is as though the cloud whistleth about me. Thou hast a great man for thy husband, but I am deserted and lonely. Another hath wedded thee ; thou art not mine. Thy mother hath bread and seed-corn in plenty ; her store cometh never to an end. When thy mother baketh bread in the morning, lo ! the pot boileth ready for the noontide meal. Long, long is it since that I saw thee ! "

It is the same plaint which echoes through all these poetical effusions—the old, old story, which is always perennially fresh under whatsoever clime you meet with it. But the songs which have nothing to do with the tender passion are also of a melancholy cast. Here is the way a youth sang to his brother in the days of old Numet Beg (who was born about 1700). Both youths belonged to Kara-koshun, but had gone to Abdall :

" Return thou home, and see how things fare there. I will abide here and catch the fish. Should the fish be few, then will I, too, return home and fish there. I long to return home ; so greatly do I long that I cannot eat. All the people here, both good and evil, quarrel with me, so that I cannot eat. I came hither to see whether it was a good place ; but my wife and my little ones abode at Yachi. I will launch my canoe at daybreak, then shall I win me home ere the night cometh. Now will I return. 'Twas foolish of me to bring skins and gear which I needed not. Even though these Abdall folk should be minded to kill me, yet will I not turn back, but will go home. Like the seven stars in the sky, like the arkhari in the mountains, I went forth from my home, and now I weep. Yea, now will I return. Farewell, my only friend in this place. After that I have left thee, and gone away home, then shall we be as though a high mountain parted us."

A hundred years ago an old blind man in Tuzun-chappgan

Natives of Abdall. The Second from the Right is Tokta Ahun ; Beside Him Stands his Mother, Kunchekkan's Widow.

gave utterance to his pain in the following song, which is still sung in the country of Lop:

"I, miserable that I am, have been stricken with blindness by God. Oh, how unhappy am I! Now see I no longer either the hut of reeds or the fields of the green kamish around it. 'Tis mine to sit lonesome at home in my sattma. Oh, how pitiable am I! Now see I not my friends; my bones are become soft as the grass. Since that I am blind, it is as though my whole body were eaten up with pain. Hard hath God punished me, in that He suffereth me not to see, neither the hut of reeds nor the fields of green kamish around it. Wherefore, O God, didst Thou suffer me to be born, since Thou hast now deprived me of the light of mine eyes? Since that I am blind, my heart is full of sorrow and desire. May God visit no other poor mortal with blindness! Since that I see not, I cannot walk, but grope my way with my hands. My children cry to me, 'What doest thou? Thou catchest not fish, thou givest us naught to eat.' Better were it God doomed me to die, than suffer me to be tormented thus in this world. Whenas I saw, I gained me money; but now I may not see it, and know it not, save whenas I smell upon it. Hard hath God punished me, in that He hath made me so wretched. Do I speak with my wife, straightway she answereth me with hard words. Whenas I saw, I had well dressed meats to eat; now she grudgeth me tea. Did I but see, I would fare forth upon the lake as heretofore, and put down my nets. Were I now to fare forth, verily I should not find the way, but should drift and be lost. Whenas I was a child, and sinned in some small thing, surely, then, my father and my mother müst have cursed me, and wished I might be stricken with blindness. In the days that are past I was wont to put down my nets; but what skill hath a man that is blind in the catching of fish? Now I may not take fish for my dear ones to eat, and they are pinched with hunger. I trusted that thou, my son, shouldest help me in my old age, and feed me, but now hast thou thrust me from thee."

Formerly these people lived almost entirely upon fish. Hence it is easy to understand that they should sing about fishing and its small misadventures. I give one specimen of this artless "lake poetry," a description of an event which happened at Kara-koshun:

"I was out on the lake. Down came the storm. My canoe capsized. And here I lie, and my father and my mother know it not. The fish and the bread that were to feed me have gone to feed the maw of the lake. When my canoe overturned, lo! I lost all things,

save only my cooking-pot, thanks be to God! What hard words spake I to one that is older than myself, or what offence have I done, that I am punished thus? My friend, that was out on the lake with me, behold! he hath lost nothing. It must be that God loveth him. Thirty fish had I in one parcel, and a dozen in another; yet went they all to the bottom. But let me now arise and hasten, then shall I reach home ere that the supper is done. I searched with my eyes the bundles of rushes that floated upon the lake, and then hastened I home. But whenas I came there, my parents spake reproachfully to me, saying, 'What hast thou done with thy fish?' And I answered them, 'Since ye set greater store by the fish than by my life which is saved, ye would do well to slay me.' Come, my friend, let us draw the boat up on land, that she may be dry."

It may not be without interest to see how the people who composed and sang these songs wrote their letters; fortunately I have preserved a few of them. In spite of their excessively servile spirit, they breathe much goodwill and a feeling of courtesy, and between the lines it is easy to perceive the great consideration with which our caravan was everywhere received. During the time I remained in the Lop country, I received a host of letters, so that I required to have a native amanuensis always at my elbow to answer them. My secretary read each letter aloud to me, and in a few words I indicated what was to be the nature of his reply. It is significant of the high respect with which I was regarded, though at the same time comical, that all these letters began with the formula "To the great king, the gracious lord, God's blessing!" The Cossacks were accustomed to call me, "Your Excellency!" and I thought that would have been a lofty enough title to satisfy anybody. But no, the begs of the Lop country thought that far too colourless; nothing less than *Ullug Padi-shahim*, or "Your Majesty," would suffice for them. Yet for some two hundred days I did feel almost as if I were the king of Lop-nor.

Whilst in Abdall I received the following letter from old Naser Beg, of Tikkenlik:

"We, your most unworthy subjects, Naser Beg, my son-in-law, and all, great and small, to our great Padishah! we wish that you, may God be gracious to you! may reach Chimen in peace and safety; and after you have arrived there, we should desire greatly to hasten and serve you, but that the amban is here, so that I cannot demand leave of absence. And yet it were very desirable that I came to see

you, and bowed down before you. If you would let me know by a line from Chimen that you have arrived there in peace and safety, I should be very grateful. As a token that I still live, I send you ten ells of white linen. Be good and forget me not."

Mirab Beg, of Ullug-köll, wrote thus :

"Your humble slave and servant! Mirab Beg of Ullug-köll, and his son, Baker Shang-ya, Seidullah Imam, Mahmet Baki Mazin, Sati Ahun, Allah Kullu, all, great and small, inhabitants of Ullug-köll, inquire by this letter after Tura's (the Lord's) health. We desired greatly to accompany you and serve you, but could not, since we feared the amban. God alone knows if we shall ever see you again. We hope we shall. When we know that you have happily come to the mountains, we shall, in truth, thank God, and we shall pray that you may come back hither, so that we may meet again."

This is how the amban of Charkhlik writes :

"To the gracious lord He-dani (*i.e.*, Hedin), who is well-affected to all, from Jan Daloi of Charkhlik. I pray that I may write and express my regret that the first time we met in Tikkenlik, we had no opportunity to show hospitality the one to the other. It was late when we met; you went your way and I went mine, but we shall never forget one another. God grant that we may meet again under happy circumstances. We ought to come nearer to one another, and know one another better, and become the best of friends. May we think but good of one another. Wheresoever you may happen to be, pray write me a letter and appoint a meeting with me. We beg to inform you that we have read the letter from Khalmet Aksakal, and are very grateful that you have asked us to have an eye upon the thieves and hold them fast. We have found the goods that were lost in the possession of the thieves, and have brought the matter to an end, in that it has been dealt with and settled according to the law. If there be aught else you desire, be so kind as to let me know it. Unfortunately, I could not come and meet you, but have been informed that you passed this way. Herewith I send you 100 *jings* (150 lbs. avoir.) of rice and two bottles of brandy, and pray you, forget me not."

According to the rules of etiquette, he had been unable to visit me, because I gave no sign of calling upon him. His brandy I sent back by the messenger which brought it. All spirits were strictly prohibited in my caravan. As a rule, the

politeness of the Chinese, whether oral or written, does not mean much; but so far as Jan Daloi was concerned, I had no ground for complaint. A year later he was removed by the Gove nor-General of Urumchi. This was said in Charkhlik to be because he had shown a too great willingness to serve a *yang-kwetsa*, or "foreign devil." Of the Boxer movement in China, with its murderous hatred of strangers, we heard not the slightest rumour in the middle of Asia.

V.

In Northern Tibet.

Mountains, Lakes, and Quagmires at High Altitudes.

CHAPTER XXVIII,

OVER THE ASTYN-TAGH.

But at last we grew tired of waiting for the storm which never came. I spent most of my time reading Selma Lagerlöf's and Heidenstam's* books, and studying Buddhist mythology. The gad-flies, however, did not relax their siege, and the wind failed to come and give us an opportunity to break through their investment. At last I lost all patience, and determined to start, let the cost be what it might, on the evening of the 30th June. Sending the caravan by land, by the seven hours' route round the marsh, I directed them to meet me at Yoll-arelish, the point where the road branched, one portion of it going on to Sa-chow, the other bending away to the mountains of Tibet. Meanwhile, I proposed crossing by canoe the same lakes which I had already traversed in April, and at Yoll-arelish, which I had already mapped on a previous expedition, I intended to resume my cartographical work.

The 30th June was a busy day, what with packing up, settling accounts, and getting the two Cossacks off to Kashgar. Besides commissioning the latter to carry my letters to Europe, I gave each of them two yambas (£16), and promised to recommend them warmly to their highest commanding officer, the Czar. They also carried a letter to Jan Daloi, amban of Charkhlik, asking him to send at once 3,000 *jings* (30 ass-loads, or about two tons) of maize to my new headquarters.

We began to load up at five p.m. The moment the camels emerged into the open air, they were surrounded by a swarm of buzzing gad-flies. However, they bore the infliction patiently; and as fast as each animal was loaded up, four men were told off to protect him with big kamish brooms. When all was ready,

* Two popular and distinguished Swedish novelists; the latter has also won great fame as a poet.

Turdu Bai mounted his horse, and putting himself at the head of the cavalcade led off at a good round pace.

Then it was the horses' turn; but they made a tremendous pother, kicking and even flinging themselves on the ground, so that we had to lash their loads with extra ropes to keep them on. At last, however, they too set off in the wake of the camels, conducted by Mollah Shah, Kutchuk, and Tokta Ahun, the son of Kunchekkan Beg.

The big and comfortable canoe which was to carry me to the rendezvous was already provisioned and equipped with felts, pipe, matches, etc., and lamps; and it only remained to say good-bye to my faithful Cossacks. I thanked them warmly for their services, and after a hearty shake of the hand saw them mount their black horses and set off along the road to Charkhlik, which town they hoped to reach next morning. They carried with them letters of recommendation to the ambans, begs, and aksakals all along the road, and intended to take the mountain route through Kopa and Sourghak, and after that travel by night to Kashgar *viâ* Khotan and Yarkand.

When I started with my boatmen it was pitch dark; but the current helped us, and we went down the river at a smart pace, leaving its dark banks rapidly behind us. At Kum-chappgan I only stayed to change my canoemen. When we started again, the moon had disappeared; but the night was clear and the stars glittered like diamonds above the wandering lakes. A faint, but refreshing, breeze flickered through the reeds, and happily, on that my last night on the waters of the Tarim, the gnats were not troublesome.

At eleven o'clock p.m. we left Tuzun-chappgan, guided by a man in a small canoe. It was perfectly wonderful the way he steered his course in the darkness through that labyrinth of high, dense reeds, across the lagoons and lakes, and through the chappgans and narrow, confined waterways. The other canoemen paddled on without a moment's hesitation and without once stopping, as though their canoes were running on invisible metal tracks, off which it was impossible for them to get astray. They did not talk, they only paddled—paddled unceasingly, and in good time together. But the breezes of the summer night failed to penetrate into those dense reedy wildernesses, and it was oppressively warm, close, and stuffy; and the miasmatic vapours rose from the tepid waters of the marsh. At intervals I slumbered, and on towards morning the men

began to sing, to keep themselves awake. The lake of Satehköll was a good deal shallower than it had been in April, so that the men were obliged to get out and draw the canoes after them. Soon after that we were forced to abandon the big canoe altogether, and take to the smaller one. Yet even that soon ceased to float, and we had to wade ashore through the mud.

Then followed two or three hours of waiting in the silence of the dark, dreary waste. At length, however, we heard shouts in the distance; then they came nearer, and lighting our lamps we went to meet them. It was Shagdur and Tokta Ahun, with the horse caravan. They had travelled faster than the camels, so that we had to wait again for them. I thought I could not employ the time to better advantage than by having breakfast; but the Lop-men had to row a long way out into the lake to get a can of fresh water, as well as a few bundles of kamish to boil it with, before even that simple meal could be prepared, for the shore was absolutely barren.

The camels came up just as day was breaking. They had gone astray in the darkness, and, misled by an ass-track, had turned off too soon. They continued without stopping, and as soon as breakfast was finished the rest of us got to horse and followed them.

The country was a mere barren waste. On the north side of the marsh the sand-dunes gave at least some relief to the desert, and the dead forest witnessed to the existence of life at a former period. But here there was nothing: the ground was as level as a pavement, and consisted of hard, rough, saliferous clay, which had once been under water. The only break in the monotony was the winding track we followed.

We struck away from the shore at an acute angle; and when the sun rose, and poured a flood of light and warmth across the desert, we could just discern the last lakes of the Tarim system like a dark line hovering above the horizon behind us. The sun rose with unusual splendour. Its beams broke amongst the light and delicate clouds which hung like a veil before its face; so that their edges, lit up from behind, glowed like molten gold, while the middle parts were stained various shades of violet. The air was clear and still, and the sky a pure pearly, spotless blue.

But an even finer spectacle was presented by the panorama of the mountains which, in the oblique, almost horizontal, light, stood out in sharp and distinct relief. Their colouring

varied from light blue to violet, shading off through silvery tints. The transitions were not at all harsh, being tempered by the distance, so that they formed a harmonious and enchanting background to the arid desolation at their feet, just as the sunrise is all the more beautiful when it follows a gloomy and stifling night.

But the sun was not without its shadows. No sooner did it show above the eastern edge of the desert than the air became filled with myriads of gad-flies, which, in clustering clouds, followed horse and rider as they moved. Long before noon the heat was oppressive, and we yearned for night to come to free us from our tormentors.

Just on the edge of the desert, where the outer skirts of the mountains began their slow ascent, we halted at the little oasis of Dunglik, or the Hills. Its altitude was 3,415 feet above the sea, and as Abdall lay at 2,750 feet, we had consequently climbed 665 feet whilst crossing the desert. The horses were put inside a shelter which had recently been built, but the camels were turned out to graze on the thin sparse steppe. We were all tired after our night march. As for myself, I dropped asleep under the first tamarisk I came to, and lay there until the sun burnt my head; after which I went inside the tent, and sat and worked, scantily attired. There was a well, 10¾ feet deep with brackish water, which, however, did not prevent the animals from drinking it. For our own use we had brought water with us from the lake, and sinking it into the well, which had a temperature of 14°.3 C., or 57°.7 Fahr., we kept it nice and cool, and every now and then I gave myself a douche from a pail. The temperature of the air rose to 40°.1 C., or 104.2° Fahr. in the shade.

I was awakened at three o'clock on the following morning, lamps and candles were lighted, and my breakfast of tea, eggs, and bread was served. We packed up and loaded the animals, and by the time that was done it was dawning in the east. When we started at 4.30 a.m. it was broad daylight, and the gad-flies had begun their strenuous day's work. They buzzed about us in myriads, and followed us a mile or so on our road, literally red with frenzy as the rising sun shone through their blood-swollen bodies. I myself killed two or three hundred which had got entangled in the camels' naked skin. Crack! went a whip, and crack! went the suctorian as his inflated body burst. But we soon got too far away from the vegetation, and they

durst no longer follow us, so that for the rest of the day we had peace from them.

We were now marching across the open, gravelly *sai*, which sloped gently up towards the mountains. It was a perfectly barren and desolate region, without a single blade of grass, without an insect or any other sign of life, nothing but gravel and sand, thinly scattered over a soil as hard as asphalt. On the left was the narrow belt of vegetation which marked the oasis of Dunglik; while on the right were the mountains, gradually unfolding themselves, as their reddish-yellow outlines became shedded out into separate chains and valleys. I took the bearings of every conspicuous peak from several different points, and noted them all down on my map. Behind us on the distant horizon was the faint, dark line of the Tarim lakes, and beyond them a low diffused haze suggested the sandy desert of the Lop country.

At irregular intervals were a number of small stone pyramids, intended to mark the road during the continuance of the storms. Asiatics consider it their duty to show a certain amount of gratitude towards their roads and tracks, and they do it by adding one or more stones to these pyramids as they pass them. Without them, they could not find their way to the springs and grazing-grounds; and when a traveller is fortunate enough to escape the storms himself, he is grateful enough to think of those who may travel that same road under less favourable conditions, and so adds his contribution to help make the road plainer.

The heat of the day began to make itself apparent in warm exhalations and warm breezes. I knew it was a long way to the first spring of Tattlik-bulak, for at every point where I had previously crossed it, this gravelly slope at the northern foot of the Kwen-lun was excessively broad. But my hope, that we should soon get amongst the mountains, was doomed to disappointment, for when we reached two huge cairns, one on each side of the trail, Tokta Ahun gave me the very comforting intelligence that we were only half-way, and yet we had been tramping steadily on at the usual caravan pace for fully seven hours.

The little pups, Malenki and Malchik, which were only five months old, had tired very soon after we started, and were then stowed away in a basket on the back of one of the camels. When the sun began to burn, we covered them with a felt, and after that heard nothing more of them until we reached camp,

when they jumped out of their hiding place as brisk and lively as possible, though a little stiff. Mashka and Yolldash were more sensitive to the heat, and when we began the second half of our day's march, they appeared thoroughly exhausted. Although we gave them water two or three times, they kept loitering behind and had to be fetched. Finally, we put them on the back of a camel. Yet they did not relish that method of travel, but struggled down as soon as the camel began to walk. Thus they dropped behind again, and Shagdur rode back to fetch them, taking some water with him. After a pretty long absence he came back with Yolldash, and reported disconsolately that Mashka was dead. When he found the dogs, they were both lying at the bottom of a dry ravine in the shelter of a shady terrace. He gave the whole of the water he had with him to Mashka, who gulped it down greedily. Then he put a cord round Yolldash and led him, while he took Maskha on the saddle in front of him. But before he had gone far, the dog turned very strange, bit the horse in the neck, and let her head fall hopelessly. Thus died the best of our dogs, and had to be left by the wayside. But we had not one drop of water, and I feared the worst for Yolldash. After several unsuccessful attempts, I managed to lash him fast on the top of a camel's load, where he lay rocking and jolting half dead with "sea-sickness."

But the rest of the animals and all the men bore the journey well. It was worth while making an extra push to escape from the killing heat in the lowlands. Getting tired of riding, I walked for several hours. The country was still the same, and the ascent imperceptible, while all day long we had the same peaks constantly on our right. But towards evening the ground became more broken, and we got amongst low hills of gravel-and-shingle, sand, and clay. Further on we could see the bare rock, a light green schist and granite, greatly weathered and brittle. Our path lay up a dry and steeply scarped glen, which was entered by numerous natural water-courses from both sides, and by numerous torrents, which, although now perfectly dry, had cut deeply down through the sides of the glen. The path wound away to the east across an infinite number of ridges, hills and gulleys.

Through the upper part of a narrow gap in the side of the glen we caught a glimpse of the brook, oasis, and refuge of Hunglugu, an especially welcome sight after such a day as we had had. The first thing we did when we reached the spot

was to send the dogs off to get water. Their delight knew no bounds; they drank, they coughed, they rolled in the grass, they barked with delight, and then drank and drank again.

There was an abundance of vegetation, chiefly noble tamarisks, which attained the dimensions of trees, though there were also grass and kamish, and a great variety of herbs; while in an expansion of the glen stood a group of rugged old poplars. But we did not stop there. We pushed on farther up, the brook growing bigger and clinging to the mountain-wall which shut in the glen on the right. We found the horse caravan, which had been a long way ahead all day, encamped at Tattlik-bulak,

The Dogs Malenki and Malchik.

in a grove of magnificent tamarisks, besides a little caravan of seven asses and seven sheep, which Numet Beg had sent on from Abdall the day before, with a store of provisions for our use.

I know nothing more delightful, after a 14½ hours' march through a burning desert, than to encamp in a beautiful oasis like this, and here we had one of the most comfortable camps I have ever had anywhere. My little Mongolian yurt was put up, for the first time, on the outer margin of the tamarisk grove, and it was so neat and cosy and inviting, with its bed, and carpet, and boxes, that I did not really miss the old ferry-boat and its snug cabin. Shagdur, Turdu Bai, and Mollah Shah erected

the white tent under the tamarisks, while the other men encamped in the midst of a bower-like thicket. At nine o'clock the temperature of the air was 20°.0 C. or 68°.0 Fahr. and of the water 12°.8 C. or 55°.0 Fahr., so that my usual wash-down was very refreshing after all the heat of the march. We were now at an altitude of 6,408 feet, or 3,658 feet above Abdall.

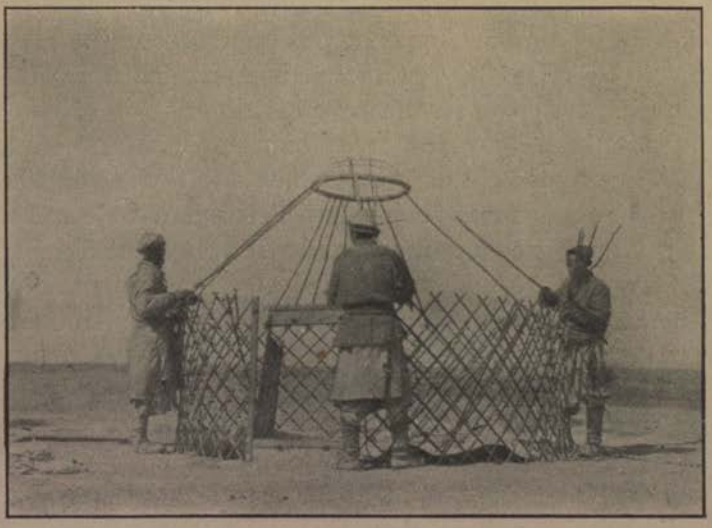
When I gave orders that we were to rest the 3rd July at Tattlik-bulak, or the Sweet Spring, the rejoicing was general. We no longer had occasion to complain of the heat; for, although the sun was hot enough at midday, it was tempered by a south-west breeze. This, however, came, not as the steady, continuous

Tamarisks at Tattlik-bulak.

blow of the lowlands, but in gusts, which were sometimes so violent that they threatened to bowl over my yurt, yet sometimes again so gentle that they died away into a dead calm. The left side of the glen was bounded by a perpendicular wall of gravel-and-shingle, and it was out of its crannies that the spring gushed; the water was quite fresh, as clear as crystal, and had a temperature of 10°.0 C., or 50°.0 Fahr. The rivulet it gave origin to ran straight into the glen brook, which was somewhat discoloured by dust and mud. The glen itself was from 50 to 200 yards wide, and after hard and long-continued downpours of rain appeared to have been filled from side to side. On the top of the wall above the spring was a cairn

of stones, surmounted by two or three staves, on one of which I read "P. Splingaert, 1894," and "C. E. Bonin, 1899;" the former was the Belgian mandarin known as Ling Darin.*

The vegetation was luxuriant, although it consisted of but few species. The fauna embraced a few small birds, besides ants, spiders, flies, ticks, and beetles. We also saw two or three gad-flies; but they had no doubt been brought up by our own camels. Had we not lost Mashka, who was a general favourite with everybody, we should have been perfectly in clover. When we started again I had the canvas skiff sewn up in a felt, to protect it against chafing, and the yurt was carried



The Frame-work of my Yurt.

by one of the horses, because they travelled faster than the camels. Thus, from this time onwards, I always found my "house" ready for me when I reached camp in the evening.

The route led up the glen, beside the brook, between cliffs of black slate, which were often connected with the bottom of the valley by sheets of gravel-and-shingle. As we advanced, the vegetation gradually died away. The tamarisks were just in flower, and the pure violet tints of their clusters of blossoms imparted a touch of life to the otherwise monotonous brownish grey of the mountain landscape. We crossed the little

* See *Through Asia*, Vol. II., p. 920.

stream repeatedly; it was delicious to have it beside us when the day grew warm. In winter the entire glen becomes choked with ice, and travellers then avoid this route for fear their animals should fall and break their legs. In fact, we did observe one camel, which had belonged to a caravan of Mongol pilgrims, lying by the side of the brook.

The sky was cloudy, and we should have had a pleasant march had we not been pursued by swarms of mosquitos, which showed an unhappy predilection for our ears and nostrils as their chosen field of operations. Their incessant tickling and stinging made the skin sensitive, and irritated it until it itched intolerably.

That evening, when we reached the little pasture ground of Bash-kurgan, or the Fortress at the Head of the Glen, my portative hotel stood ready erected and furnished by the side of the track. But there were several things to be done before I could step inside and enjoy a much-needed rest. First, I unpacked my meteorological instruments; then I labelled and put away the geological specimens which I had collected during the day; then I drew my maps, and wrote my notes and observations. By this dinner was ready. Then at nine o'clock came the reading of the meteorological instruments and the boiling-point thermometer, and the winding up and comparison of the chronometers; after which I went out and played with my dogs, and fed them. My day's work was seldom over before eleven o'clock at night. When it was, I usually lay and read for half an hour, and then went to sleep, and the fresh, strong, healthy mountain air made me sleep the sleep of the just. At nine p.m. the thermometer stood at 12°.1 C. or 53°.8 Fahr. What a difference two days' journey made!

During the night the temperature dropped to 0°.1 C., or 32°.2 Fahr., and next morning we unpacked our warm winter wraps.

I had made up my mind I would not travel up to our new headquarters at too rapid a rate, and so we sacrificed another day to rest at Bash-kurgan. The place was named from the ruins of a small Chinese fort, crowning an isolated hill, and built at the confluence of three other glens with the long ravine of Tattlik-bulak.

As this trench or ravine pierced the lower range of the Astyn-tagh, or Astun-tagh, we were already on the other side of it when we reached Bash-kurgan. The next day took us up

towards the main crest of the same system ; but we were unable to get over it in one march, and stopped for the night at Bash-yoll, a little grazing-ground with a splendid spring (temperature, 5°.8 C., or 42°.5 Fahr.), beside the ruins of a Chinese fort.

On the 8th of July we had a long and desolate piece of road before us, and consequently carried a supply of water. On both sides our path was overhung by steep, denticulated, irregular masses of rock ; but gradually it widened out, and eventually led up to an easy, flat-topped pass, which, strange to say, bore no other name than simply Davan (the Pass). Hitherto the road had run east ; now it turned towards the south, although a defile did lead on to the east between cliff-like rocks. There we saw two wild camels, but they were in full flight. This made the third region in the centre of Asia where I had observed these animals ; so that, with the information I gathered subsequently, I am now in a position to trace out a map of their distribution.

There was a slight dew on the summit of the pass ; but when we descended into the broad, flat latitudinal, or parallel, valley which separates the Astyn-tagh from the Akato-tagh, and were crossing it, it began to rain merrily, and the thunder rumbled amongst the mountains. The valley was a perfect desert, without a single sign of life. After a ride of 13 hours we reached a nameless steppe, where there was neither water nor grazing, though the teresken shrubs did afford a supply of firewood.

CHAPTER XXIX.

THE START FOR TIBET.

On the morning of the 9th July the sky was perfectly clear; during the previous night the temperature had fallen to 0°.7 C. or 33°.3 Fahr. Our order of march was as follows. The asses and the sheep started first. Then followed Mollah Shah and Kutchuk with the horses, which always arrived at the next camping-ground a long way in advance of the rest of the caravan. After them came Turdu Bai and Mollah with the camels; while I, Shagdur, and Tokta Ahun brought up the rear. The last-named, who was well acquainted with all that region, acted as my cicerone. Shagdur held my horse when I took the compass-bearings of the mountain-peaks, or collected geological specimens, though I left him to pack them up in newspaper. All this generally made us an hour or two behind the others in reaching camp.

To the south-west lay a magnificent mountain mass crowned with perpetual snow, called Illveh-chimen, and on this side of it were two small salt lakes, Uzun-shor and Kalla-köll. At the foot of the Akato-tagh we rested for an hour beside a small spring and pool, called simply Bulak, the water of which was beautifully fresh (12°.0 C. or 53°.6 Fahr.), and our thirsty beasts, which had had no water the day before, were allowed to drink their fill. There was also luxuriant grass around the spring, though its extent was limited. During our short halt the weather suddenly changed. The sky clouded over, and it began to rain heavily. It was evident we had already entered the zone of the characteristic Tibetan weather, in which sunshine, rain, and wind alternate incessantly at intervals of only a few short minutes.

Leaving the spring, we followed a dry ravine towards the south-west, and were met by a violent storm from that direc-

tion. It was not rain, but wind, which made the dust and sand spin, and drove them with cutting force into our faces, till the skin felt quite sore. The storm advanced upon us like a compact, yellowish-grey wall of spinning whirlwinds. and enveloped us in an impenetrable haze, which completely blotted out every feature of the country. We could see nothing except the path in front of us. It was as much as I could do to sit in my saddle, and when I tried to jot down my notes, it was like tearing the paper to pieces. But after two hours the hurricane stopped quite as suddenly as it began. It was as if we had waded through a river of rushing wind. And no sooner was the storm past than the air cleared at once, and became as pure and transparent as it was before. A very different storm from the storms in the lowlands! But we soon had convincing proof that these violent mountain hurricanes really do carry drift-sand with them; for on the top of the double easy pass of the Akato-tagh we found a number of sand-dunes in miniature, which had been formed there by the south-west wind.

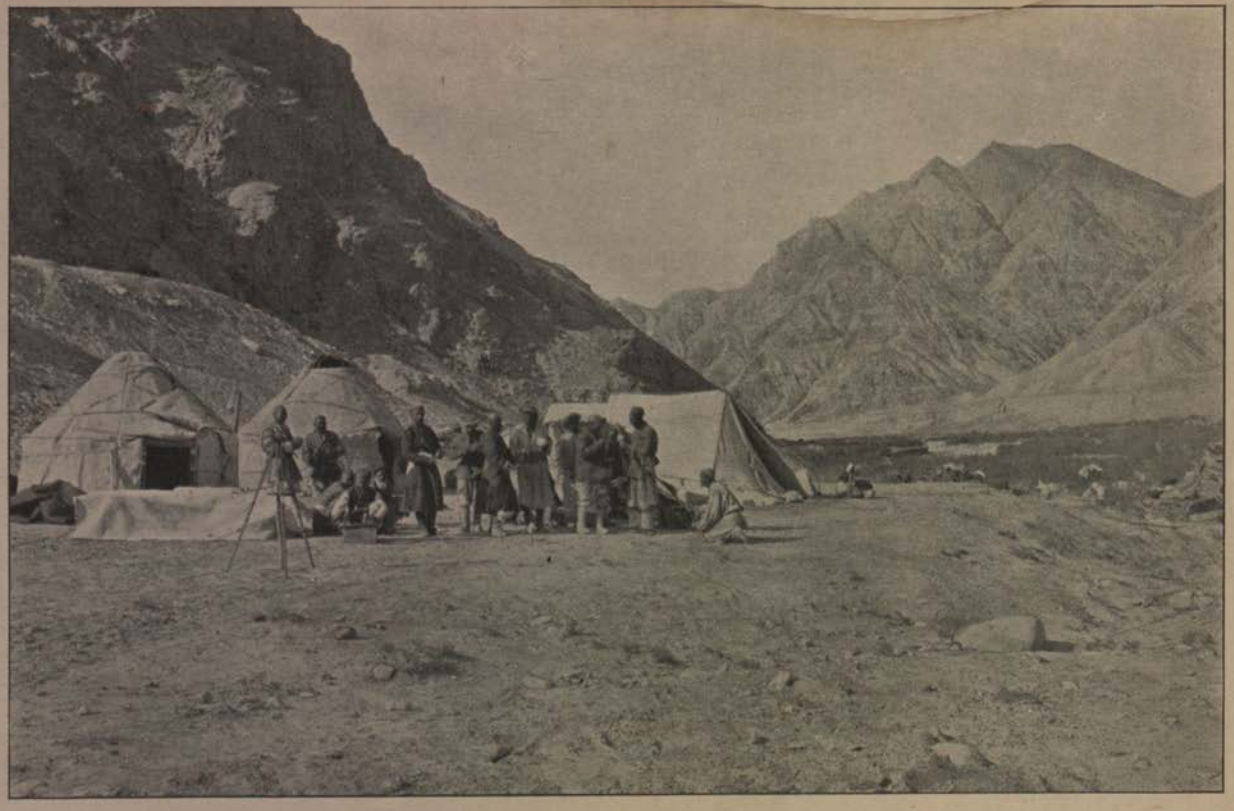
The southern flank of the Akato-tagh, which we crossed to the south-east, was a repetition, in point of orographical relief, of the northern flank of the Astyn-tagh. The *sai*, or hard gravelly slope, descended gradually to a broad valley, which ran from west to east, and on the south was fenced in by another mountain-range, the Chimen-tagh. This gravelly formation was succeeded by *kakir*, or a horizontal deposit of argillaceous mud laid down in water after rain. There we found the skeletons of the two horses belonging to Cherdon and Faisullah's caravan, which had died on the way up. At length we caught sight of the yurt standing on the shore of a small lake, which we had seen in the far-off distance from the *sai* above. It was known simply as *köll*, was about one-third of a mile in diameter, and surrounded by grass.

Strange to say, the gnats and gad-flies again honoured us with their company even at this altitude; the former even kept with us until after we left the main camp in the Chimen-tagh. The moment the wind dropped, out they came in swarms. The horses and dogs suffered the most; the camels' skin was too thick for their delicate probosces to penetrate. The gnats haunt the mountains for about two and a half months in the summer. You would think it impossible for their larvæ to survive the bitter cold which prevails in those altitudes in the winter; but they do.

On the 10th of July we still continued towards the south-east, striking obliquely across the valley, over several deep gullies, which, when in flood, helped to swell the large stream that, farther east, emptied itself into Ghaz-nor (or Gaz-nor) on the frontier of the country of the Tsaidam Mongols. We halted beside some springs, surrounded by fresh grass, on the edge of a gully called Temirlik. To take my astronomical observations next day was a veritable baptism of fire, because of the gnats. They used maliciously to wait until I had both hands engaged with the screws of the instrument, and then opened fire.

At a subsequent stage of my travels, Temirlik (9,715 feet above the sea) became a very important centre. Even now several visitors came to our camp. Simultaneously with us there arrived four gold-hunters from the mines of Bokalik, who had been two or three months in the mountains hunting for gold, but had discovered nothing worth speaking about, and were now returning discontented to their homes in Khotan. Here, also, we were overtaken by the maize caravan, which I had ordered from Charkhlik, led by five men, who brought a polite letter from the amban. And, last of all, came a couple of messengers from my principal camp, from which we were still two days' journey distant, who reported that all was well. One of these messengers was Khodai Värdi, whose name means "the God-given," but who, as a matter of fact, was a disagreeable individual from Yanghi-köll, who subsequently tried to play me an unfortunate practical joke. The other was an Afghan named Aldat, from Cherchen. He had spent the winter in the mountains shooting yaks, the skins of which he sold in Keriya. He was a fine, handsome young fellow, who lived the life of a real Nimrod amongst these wild mountains. Coming up in the autumn with a good stock of ammunition, his musket, and his furs, he used to spend the whole winter hunting, carrying neither tent nor provisions, but living on the flesh of the yaks he shot, and drinking of the springs which are fed by the everlasting snows.

In the summer his brothers used to come up with a train of asses, collect his stock of yak skins, cut out the serviceable parts, and carry them down to Cherchen. He had been engaged by Islam Bai because of his knowledge of those mountainous regions right away to the foot of the Arka-tagh, though he had never been south of that range. I took a great fancy to Aldat, and proposed he should accompany us on our first expedition



The Headquarters Camp at Mandarlik—Looking Down the Glen.

into Tibet, and he closed with the proposal without hesitation. His manner of life struck me as being remarkably strange, and yet, at the same time, as very fascinating. I asked him what he did when he had no luck, and failed to kill any game, and so got nothing to eat. "I go hungry till I do find a yak," said he. Where did he sleep? In crevices and ravines, sometimes in caves. Was he not afraid of wolves? No, he carried tinder and flint with him, and always made a fire in the evening to cook his yak steak, and trusted to his musket. Did he never lose his way? Oh, no, he couldn't lose his way! He knew every pass, and had hunted every valley times without number. As for being alone, he thought nothing at all of that. There was nobody he cared anything about, except his old father and his brothers.

What a restless, wandering spirit! I can hardly conceive a more dreary country to be alone in than Northern Tibet. The desert could not be worse. One might get through the days—but the nights! When the cold freezes you to the marrow, and the dark mountain ranges shut you in and menace you with all sorts of imaginable evils! Aldat's life was, of a truth, "dangerous, poor, and great," and even now, when he has long been dead, I cannot understand how he stood it; he remains a mystery to me down to this very hour. I was surrounded by everything I needed—servants, a bodyguard of Cossacks, night-watchmen and watch-dogs—and yet, when the snowstorms raged around my yurt and the wolves howled in the mountains, I often felt a sense of utter loneliness steal over me.

Every one of the men who accompanied me on this expedition to the Chimen-tagh was destined to distinguish himself in some way or other. Turdu Bai was the best Mussulman I ever had in my service; and when the camels were under his care, I was always perfectly comfortable about them. Shagdur was above praise; I do not know how to describe sufficiently the services he rendered me. He learned to do everything; he never forgot anything, and wanted no reminding; life was very pleasant in his company. There was a something about him which was very sympathetic. I especially admired his bold and impetuous courage in moments of danger, and the calmness with which he received commissions of real difficulty. Twice, subsequently, he had occasion to show that he was ready to lay down his life for me. It was elevating to have about one a man who exhibited such a degree of disinterested fidelity; no

wonder, then, I became attached to this Buriat Cossack. In his own country he worshipped the idols of Lamaism; but now he turned his back contemptuously upon them. This was not my fault, for I did not consider it my business to shake the faith of any Asiatic; but there was much that went on in my caravan that gave Shagdur, and indeed all the other Asiatics as well, occasion for a good deal of thought—things they had never even dreamt of.

Tokta Ahun of Abdall was a thorough honest good fellow, a man of sound understanding, who proved himself exceedingly useful. I have already said, that he accompanied both the horse and the camel caravan to Temirlik, and he now went with us for the third time when we started for our new head-quarters at Mandarlik, whither they had recently been flitted from Temirlik, because of the gnats. As he will play a conspicuous part in a later expedition, I will say nothing more about him here. With Kutchuk, also, the reader will become better acquainted later on. He, also, was a fine fellow, and uncommonly useful, a sort of Asiatic "Sven Dufva." * Mollah Shah was also with us in Northern Tibet. It only remains to mention Mollah, the "Doctor," a comical little fellow of fifty, a thin wrinkled old man, without a trace of beard or moustache; for which reason we sometimes asked him in jest, whether he were not really an old woman, or at all events a Mongol—an appellation which the faithful of the Prophet do not regard as altogether flattering. His voice was shrill and piping, and he was fond of talking to himself, especially of an evening. He was very full of fun, however, and knew what he was about, and everybody liked him. With Mollah, too, we shall become better acquainted, for he accompanied me on my second expedition to Lop-nor. This man must be distinguished from Mollah Shah, previously mentioned, for he also took part in this expedition.

The evening was celebrated by a furious tempest from the west, which threatened to batter in my yurt, until we stayed it down again all round

On the 12th of July, our course being eastwards, we were not long before we turned our backs upon the zone of vegeta-

* The type of the man of "poor brains" who shows a "good heart" in a heroic fight. He figures in the *Fänrik Stål's Sägner*, by Runeberg, the national poet of Finland.

View of the Main Crest of the Chimen-tagh from above Mandarlik.

tion, in that we rode across hard, barren, gravelly ground, though we had all the time on our left the light-coloured belt of grass-land, which stretched away to the débris which muffled the foot of the Akato-tagh, whence two or three troops of *kulans* (or wild asses) watched us with curiosity. Just after we passed the spring of Kumutluk, which filled up the greater part of the valley, we caught a glimpse of the large lake of Gaz-nor to the north-east. At its west end the lake was broad and rounded, but gradually narrowed towards the north-east, until finally it issued in a little brook. Owing to the treacherous marshes which surrounded it, it was only approachable at a single point. Its shores were in places as white as snow, and its water as salt as brine. In front of it was a little freshwater

Our Headquarters Camp at Mandarlik—Looking Down the Glen.

pool called Ayik-köll, because bears were said to visit it for the sake of the berries which grew on the bushes near it. This pool was overgrown with kamish, and abounded in wild duck, which winter in that district; but Gaz-nor was entirely destitute of vegetation. The *boghana* bushes, kamish, and rushes which grew at Chigghelik (9,768 feet), or the "Place of Rushes"—the Mongols call it Dundu-namuk, or the Middle Spring—south of Gaz-nor, were the cause of the air there being literally thick with gnats and mosquitos, which tormented us worse than they did anywhere along the Tarim; for their bites produced an eruption of the skin like eczema.

We had now only one day's journey to go to reach our head-quarters camp. It took us up the glen of Mandarlik, deeply trenched between gravel-and-shingle terraces twenty-five feet high. Higher up we met a bubbling brook of bright crystal water. When we entered this transverse breach in the northern face of the Chimen-tagh, we left behind us the northernmost

outcrop of the rocks and came amongst the granite, which thrust out its fantastic craggy buttresses nearer and nearer towards each other from both sides. Looking backwards, we saw as through a wide gateway the lake of Gaz-nor, and beyond it in the distance the Akato-tagh. Upon reaching an expansion of the glen, we turned our horses, mules and camels loose to graze. Cherdon, Islam Bai, and Faisullah came to meet us on foot, and an hour later we were snugly housed in our new quarters.

Before starting on our first Tibetan expedition, we granted ourselves a week's rest in the glen of Mandarlik (11,277 feet). It was a splendid place, with plenty of grass. Our camp stood

A View Just Above Mandarlik.

on a terrace on the left bank of the brisk little brook, which sang as it danced down the glen, except after rain in the higher regions, when it swelled to a considerable torrent. The Cossacks and Ali Ahun, the tailor, whose hands were never idle, lived in the big Mongol yurt, behind which Shagdur made a fence of planking, to protect the meteorological instruments from the attentions of the camels. Some of the Mussulmans lived in two spacious tents, others behind the sheltering barricades made by the maize sacks and the camels' pack-saddles when ranged round in circles. My own quarters were in the smaller Mongolian yurt ; and in front of it stood all my big cases, stacked up close together, and covered with a white felt, to protect them against the frequent showers. The view up the glen was magnificent, the background being formed by the main crest of the Chimen-tagh, with its glittering snow-fields. Those of the camels which had already been grazing two months in the

The Start from Mandarlik.

mountains were as fat as could be, and in the pink of condition; indeed, all the caravan animals looked well. Only 42 of our 50 sheep were left, and we had acquired three fresh dogs from the nearest Mongol camp at Jurkhak.

Shagdur went over to see the Mongols there, and had a very friendly reception. They promised to sell us any animals we required, and hoped that I should visit them. One day Cherdon rode up the glen and fell in with a herd of 50 yaks, one of which he killed, a fine fat cow. As for me, I took astronomical and other observations, made little trips in the neighbourhood, and got ready for the next big expedition. We told off provisions to last seven men for two and a half months, and then fastened them ready on the pack-saddles. Two cases accommodated the instruments and my own personal belongings.

At the headquarters camp I left behind Islam Bai as caravan-bashi, or head-man; Faisullah, to look after the four camels from Abdall; Khodai Kullu, Kader, and Khodai Värdi, to attend to the horses; Ali Ahun, to do tailor work, and Shagdur as guard and meteorologist, it being his duty to take the observations three times every day. Musa, from Osh, was to go with us as far as the lake of Kum-köll, taking six horses for the purpose of lightening the loads of the other animals; but from Kum-köll he was to return in company with Tokta Ahun. The last-named begged that he might spend the summer at Mian, where he was growing wheat; but I asked him to join us again at the end of two and a half months, and at the same time bring with him half-a-dozen fresh camels.

I bestowed great care upon the selection of the caravan I was to take with me in my projected expedition. It was composed as follows: Cherdon, as my right-hand man, body-servant, and cook, as well as tent-man; Turdu Bai, caravan-bashi of the seven camels; Mollah Shah, for eleven horses and one mule; Kutchuk, to act as boatman in my boating trips across the lakes. One Niaz, from Keriya, a gold-seeker, whom we chanced to meet in the mountains, was to act as hodman to the other Mussulmans, and Aldat, the Afghan, was to be our guide as far as his topographical knowledge extended. Yolldash, of course, went with us, and generally slept in my tent. But we only took two of the other dogs, Malchik and a big yellow Mongol dog resembling a wolf. We were also accompanied by sixteen of the sheep, which Niaz, the gold-seeker, drove and guarded in the wake of the caravan.

CHAPTER XXX.

OVER THE CHIMEN-TAGH, ARA-TAGH AND KALTA-ALAGAN.

ONCE more we turned our backs upon the abodes of men, and set our faces towards the unknown parts of the world which were still a *terra incognita*. We soon left the principal valley on our right, and struck into a smaller glen without water, but studded with isolated grass-grown hills, backed by high black rocks, with a serrated edge. Thence, after crossing a secondary pass, we followed a path, frequented by hunters and gold-seekers, which led towards the south-east across extensive undulating pasture-grounds. On our right we had magnificent mountain scenery, with almost vertical cliffs. Then over another pass, and we began to descend the glen of Dung-sai, the brook of which never dries up, because it is fed by perennial springs. But although we zigzagged up and down over hills and passes, we were all the time gradually ascending to higher regions. The declivity which led down from the second of the two passes just mentioned, although as easy as possible for the horses, was steep and difficult for the camels, which made a glissade down the gravel.

The mountains began to assume a more Alpine character in the glen of Kar-yakkak (the Glen of the Falling Snow), which had an altitude of 13,072 feet above sea-level. A clear brook bubbled amongst the waterworn granite blocks which strewed it, while small and pretty flowers grew amongst the moss and grass. We had plenty of fuel in the shape of the droppings of wild yaks and kulans. Two or three yaks' skulls, which we came across, proved that the district had been visited by hunters, and ashes in a cave close by showed where they had spent the night. In several places the ground was burrowed by marmots (*davaghan*), and we often saw these nimble and wideawake little rodents sitting at the entrances to their runs as we

approached. The partridges called busily to each other on the mountain sides, and Cherdon brought in a brace for my supper.

We pitched camp in the upper part of this fascinating glen. It is true, we had not made anything like a full day's march; but fresh animals, carrying big loads, ought not to be overtaxed at the start. As time went on, however, the loads would naturally grow lighter, for the geological specimens which we gathered, although amounting to a goodly collection, did not really add much to the total weight of baggage.

Towards the afternoon a north-easterly gale sprang up, and a perfect cascade of heavy black clouds came pouring down the glen; farther on, they condensed into a continuous downpour. When we left Mandarlik the sun was burning hot, and the air thick with dancing gnats; now it was already bleak autumn. And on the following morning, when I stepped out of my yurt, it was quite wintry: the snow fell in thick flakes and the ground was everywhere covered with snow. The depth of winter in the middle of July, and that in the heart of Asia! If the summer was like this—well, we could not help feeling a certain sense of respect for the winter.

We thought we would wait for better weather; but the snow did not stop, and the day was lost. Sometimes the snow ceased to come down in flakes, and took the form of hail, which rattled noisily against the coverings of the yurt. The temperature, however, kept just above freezing-point, and at midday the snow began to melt, causing the water to trickle in at every seam. The clay soil around the camp became slippery and sticky; you felt as if you were paddling about in the mud of a duck pond.

A slight acquaintance with this, the fourth of the parallel ranges of the Kwen-lun system, was sufficient to show that it differed very greatly from the preceding three ranges. Whereas they were bare, possessed no perpetual snow, and exhibited rounded and weathered forms, this range, the Chimen-tagh, was Alpine in its character, and had a copious precipitation, with a resulting abundance of vegetation. A short distance back we had been obliged to tramp 13 to 14 hours to get from one spring to the next; here we found water at every step.

Although it was still snowing on the 22nd July, we decided to wait no longer. By noon, most of the snow had melted, though the mountain-tops still glittered white. In the depressions the snow fell in the shape of big moist, feathery

flakes, which disappeared the moment they touched the ground, leaving it wet and slippery; but on the heights above it was granular, light, and round. This last variety was more pleasant for the equestrian, for the hail readily rolled off; whereas the flakes stuck to us, and wetted us. There was a constant drip, drip, from our caps, our hands got wet and numb with cold, and my mapping sheet wrinkled up and was spoiled. We were unable to see far ahead, and could obtain no general view of the contour and arrangement of the mountain peaks. To the north, however, the weather lifted once or twice, affording us glimpses, as through a tunnel, of the dome-shaped, flat-arched ridge of the Akato-tagh.

Our day's march described a wide curve from the south-east to the west, round a massive knot of the Chimen-tagh, crossing over innumerable gulleys on the way. We were all glad to stop when we reached Yappkaklik-sai (13,117 feet), where there were teresken shrubs, but poor grazing. Yet it was not very pleasant sleeping on the ground with nothing but a carpet between one's ribs and the mud. As the temperature during the night fell below freezing-point, the snow did not melt, but lay very much thicker, especially as it came down faster than ever the whole of the evening. Strangely enough, it was sometimes so clear immediately above our heads that we saw the stars glistening, whilst all around us the snow was tossing its huge flakes in every direction. It was, however, a good thing it no longer melted, but lay as it fell, thus making a warm blanket for the yurt. The thermometer went down to −4°.8 C. or 23°.4 Fahr.

Next morning I was awakened at daybreak by a fearful commotion in the camp, and upon hurrying out I learned that the shepherd Niaz, and all the sheep except four, were missing, and tracks in the snow plainly showed they had been visited by wolves during the night, which had been pitch dark. I at once sent out all the men after the marauders, Cherdon riding with his rifle in his hand; and about ten o'clock they came back with Niaz and one sheep. They found nine others torn to pieces amongst the hills, and one was missing entirely.

Niaz's story was as follows: He slept as usual under a felt carpet close beside the sheep, which were all loose except four; for if you prevent a few of them from straying, the others will remain beside them. In the middle of the night he was awakened by a trampling in the snow and by the bleatings of the sheep;

but owing to the howling of the storm he could not hear very distinctly. However, he at once jumped up, and saw three wolves, which had crept up against the wind, on the very point of attacking the sheep and driving them out of camp. Niaz stupidly never thought of calling up the other men, but rushed off after the sheep, and had kept on after them all the rest of the night, though he only managed to save one. The wolves had planned their attack so cunningly that the dogs heard nothing of it. Our Mongol had already run away; Yolldash was sleeping in my yurt; and the inexperienced Malchik lay curled up like a hedgehog behind the men's tent. The men cursed and swore at every wolf in existence. But what good did that do when we had lost more than one half of our supply of meat?

Soon after we left this ill-omened camp, and were striking up into the pass, we were amazed to see the missing sheep coming running through the hills, terrified, and beside itself. Upon perceiving us, it stopped, and looked at us narrowly, evidently wondering whether we were friends or enemies; yet seeing its five companions, it no longer hesitated, but hastened to join them. It had no doubt been wandering about all night, having, luckily for itself, got separated from the others that were killed.

The day turned out clear and bright, and the snow melted fast. We were now close to the summit (14,007 feet) of the principal pass of the Chimen-tagh, and upon surmounting it a magnificent panorama opened out before us. Right across our field of vision from east to west stretched another mountain-range, the Ara-tagh, entirely sheathed in snow from top to bottom, although only a few of its peaks, in the south-west, actually bore perpetual snow. Between the Chimen-tagh and the Ara-tagh was a broad, latitudinal or parallel valley, called by the simple name of Kayir (the Clay Mud Valley). It was traversed by a small river, which flowed towards the west; later on we explored where it went to. Beyond the stream to the south were wide grazing-grounds, dotted over with troops of wild asses and herds of antelopes.

With regard to the orographical structure of the Chimen-tagh, I will only say now, that it is asymmetrical. The valley of Chimen lies at an altitude of 9,715 feet above the sea, but the valley of Kayir at 13,731 feet; thus we had ascended another of the huge steps which lead up to the plateau of Northern Tibet. Seen from the north, the Chimen-tagh wore

the appearance of a gigantic mountain-chain; seen from the south, it had quite an insignificant appearance, owing to the slight difference in the relative altitudes.

At this camp, too, we had a little mishap with the sheep. When I as usual made the round of the camp after taking the meteorological observations, I found that only two out of the six sheep were tethered, but as wolves were probably prowling about in this quarter also, I ordered that they should be all tethered. But when they tried to fasten up the four that were loose, off they went in a mad panic. Although it was now quite dark, off went the men after them, and their shouts soon died away amongst the hills. At length Cherdon returned, bringing two of the sheep, which he had caught with a lasso. But the other men did not come in until two hours later; they had been obliged to drive the poor brutes down the glen and there catch them in traps. After that we always kept them fastened up, until we gradually killed them off.

The next day, favoured by beautiful weather, and a blue sky, without a speck of cloud to mar its serenity, we prepared to storm the next barricade in the border-ranges of Tibet, namely, the Ara-tagh, or Middle Chain. The ascent was by a little ravine, traversed by a rivulet from a natural spring. The top of the pass of Ak-chokka-aytuseh (14,348 feet), or the Pass of the White Cliff, afforded us a repetition of yesterday's panorama, except that the range we now looked upon was a fresh one, namely, the Kalta-alagan, from which the Aratagh was separated by another latitudinal valley, which farther west was connected with the one previously mentioned. There the two rivers which flowed down these valleys merged together, and the united stream then broke through the Chimen-tagh into the Chimen valley.

The transverse valley which led down from the pass was very deeply scarped between its erosion terraces.

My caravan always outstripped me and got a long way ahead, for I was continually delayed, taking observations in the passes and at the entrances of the glens on both sides, collecting geological specimens, photographing, sketching, etc. The road still went up and up, until we reached the top of a rounded pass; then down it dipped again into another glen, deeply trenched in the mountain side. It began to get dusk, and cold, and we were longing for a glimpse of the column of smoke, which generally announced that the caravan leaders

had discovered a suitable place for camping in. But on and up went the trail, without our being able to perceive the least sign of a tent. The vegetation came to an end, and we ascended to colder regions. It was evident the caravan had pushed on over the next pass; although the large river which flowed beside us seemed to indicate that the pass over the Kalta-alagan must still be a long way off. We wondered why the men had gone on, and not stopped where fuel and grass were plentiful. Eventually the trail swung round a projecting elbow of the cliffs, and entered a little side-glen, which plainly led up to a nearer pass, where, however, except for two or three pools amongst the stones, there was no water. But it was now dark and I could not see to work any longer. What was to be done? We could of course easily ride on; but I could not leave a gap in my map, and least of all at such an important point, where we were about to cross a pass of the first magnitude. I therefore simply stopped where I was, and bade Tokta Ahun go on until he overtook the caravan, and then return with my yurt and boxes.

In the meantime, Cherdon and I did not have a particularly lively time of it in the cold and darkness, at an altitude of 15,263 feet above the sea. At nine o'clock we took the usual series of meteorological observations, and the reading of the boiling-point thermometer, which, owing to the strength of the wind, occupied us a considerable time, and was only taken at all after we had screened the lamp with a cloak. That finished, we had nothing to do but wait. We crept close together to keep one another warm, and mutually related our experiences of similar situations. Cherdon had not much to boast of in that way from the manœuvres in Transbaikalia, but I had spent the night amongst jackals in Persia, had been nearly frozen to death on the shores of the lake of Kara-kul, and many a night had lain awake in the weird desert of Takla-makan.

It was too cold to sleep, and the frost grew keener; as we had no furs, we were forced to keep moving about to prevent ourselves from freezing. But we had been in the saddle 11 hours besides doing a good deal of work during the time, and nature at last asserted her rights, and we grew heavy and drowsy. Then we again crouched together between two big stones, which afforded us a certain amount of shelter. Before many minutes passed, we were both startled by the long-drawn howl of a distant wolf. We at once sprang up and fastened our horses, which were impatiently scraping the ground close beside us,

and Cherdon held his rifle in readiness. If only we could have made a fire, the situation would have been very much less disagreeable, but although we hunted all over the neighbourhood we failed to find either yak-droppings or teresken scrub. Besides, it was so dark that we had to feel where we were going with our hands. The only way to keep the blood in circulation was to stamp our feet and flap our arms together.

After waiting five weary hours, we at length heard a rattling amongst the gravel. It was Kutchuk and Tokta Ahun, with two horses and the yurt. Half-an-hour later they were followed by Turdu Bai, with my cases and the dinner service on camels. The men blamed Mollah Shah for going on with the horses after Aldat told him there was good grazing near a little spring on the other side of the pass. As they also brought fuel with them in a sack, we soon had a fire alight, and I can assure you that when at last I did get my dinner at three o'clock in the morning it went down famously after the seventeen hours' fast. Day was already breaking on the barren mountains when we retired to rest.

Wearied by the exertions of the preceding day and night, we did not get started the following morning until ten o'clock. After traversing the remainder of the distance to Camp no. XIV. we picked up the rest of the caravan, and proceeded up the gentle slope to the pass of Avras (15,703 feet), by which we crossed the Kalta-alagan (Kalta's Hunting-Ground). Here a view of immense amplitude and sublimity unrolled itself in the south. It was no longer a single definite mountain-range, but a whole world of mountains, which it would take months to unravel. Far off in the south-east were gigantic mountain-masses covered with snow, which seemed to belong to one of the usual east-west ranges. More immediately south of us, and forming a continuation of the foregoing, was another stupendous isolated group, or mountain-knot, also mantled with perpetual snow. In the south-south-west we saw the white shimmer of yet another mountain-range, clearly situated to the south of the valley stream which picked up the Kum-köll. Along the line of the southern horizon were snow-fields and glaciers or fleecy clouds, it was difficult to tell which. I inferred, however, that they were the tops of the Arka-tagh, the culminating range of the Kwen-lun system.

A dry transverse valley led down from the pass to the open flat country, and there, beside a spring situated amongst low hills, we found the caravan encamped. I gave Musa and Mollah

Shah a good wigging for making such a long march the day before.

On the 26th of July we turned due west, and travelled at right angles to the route which we had been pursuing during the past few days; that is, we struck off in the direction of the upper lake of Kum-köll, which was visible in the distance through a field-glass, though it was afterwards hidden from us by lower hills and undulations of the surface. Our route thus lay down the broad and spacious latitudinal valley which ran along the southern foot of the great range of the Kalta-alagan. This range not only thrust out several spurs and ramifications across the valley, but overtopped it in occasional snowy peaks. On the opposite side of the valley was a wide belt of sand, which I at first took for a smaller range of hills running parallel to the bigger ranges; but when we approached nearer to it, I perceived that it consisted of pure sand-dunes, of the same yellow colour as those of the Takla-makan, and very nearly as much developed. Thus the general conditions for the formation of an "ocean of sand," like that which existed down in the desert, obtained here also, at an altitude of 12,000 to 14,000 feet above the level of the sea. The transition from the soft or gravel-strewn valley bottom, with its scattered teresken scrub and other combustible vegetable growths, to the belt of sand was extraordinarily sharp. The crests of the dunes ran from north to south, and appeared to have been built up by predominant westerly winds.

With the sand continuously on our left and the Kalta-alagan on our right, the day's march was extremely monotonous, although vast numbers of kulans were grazing and frisking all over the steppes, which sloped gently westwards towards the lake. Marmots were common, and used to sit up with their fore paws crossed over their breasts until the dogs got near them, then they darted into their holes. Hares, too, abounded, and wild-duck flew overhead on their way to the lake. Once more the gnats came and assailed us, but retired shortly after sunset. It was summer weather all day. The temperature rose to 20°.0 C., or 68°.0 Fahr., and it felt oppressively hot, because of the stillness of the atmosphere. We were only reminded of the great altitude by our shortness of breath and the beating of the heart which ensued upon even very slight exertion.

Aldat and Cherdon rode towards a troop of wild asses (kulans), 34 in number, which, however, fled at their approach, except

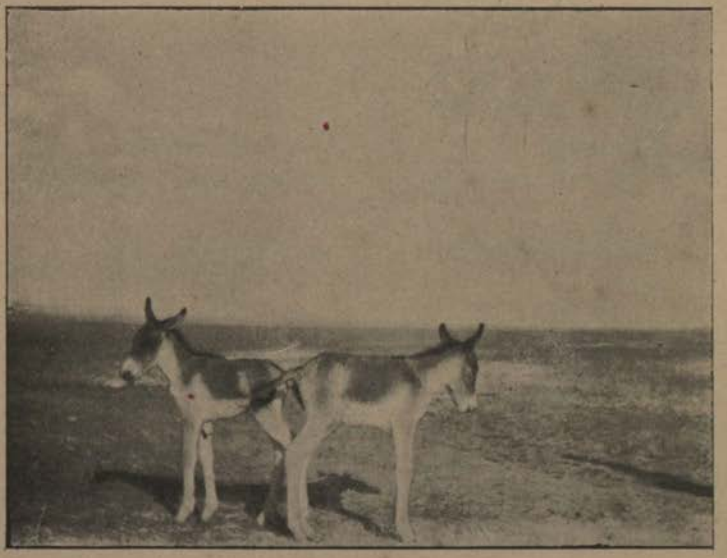
a she-ass and her foal. But as the men still continued to press on, the mother finally deserted her offspring, which proved to be only four days old. The little creature made no attempt to escape, but stood quite still, until the two hunters picked it up. Aldat placed it on the saddle in front of him, and brought it in. We then packed it in a felt, and hoisted it upon a camel's back—a method of travelling to which it took quite kindly. We also captured another kulan foal at Camp no. XV. in precisely the same way.

When we encamped, we let them both range at will amongst the tents and stores, and they showed no fear when we patted them. I was anxious to rear them on milk porridge, until they could shift for themselves, which, it was said, they would be able to do three weeks after birth. But when I consulted Tokta Ahun about the matter, he said they would not live longer than five days; he had no less than eight times tried to rear wild asses, but on every occasion had failed. Upon this, I ordered that they should be taken back to the places where they were captured, so that their mothers might find them again, and Cherdon and Aldat were already mounted to carry out my order, when Tokta Ahun said it would be useless. His experience was that once a young kulan had been touched by the hands of man, its mother fled from it as from the pestilence. Nor did she appear to miss her offspring or grieve for it, but kept with the troop she belonged to, and shunned the place where she lost it.

Had we had a brood mare with us, I dare say we could have managed to rear our two little captives. The men told me that a great number of kulan foals perish every year in the Chimen valley, because, during the first few days of their existence, they are unable to accompany their mothers on the approach of danger. When thus deserted, they die of hunger, or are torn to pieces by the wolves. The older kulans are no doubt able to protect their young, so long as the latter are with them, otherwise their numbers would not increase.

In the meantime we took the greatest possible care of our captives, which readily learned to sup up their sloppy porridge. But they were doomed, and as in the evening they showed signs of pining away, and were longing greatly for their mother's milk, I ordered them to be killed. The Mussulmans took possession of their skins, and ate the meat, which they declared to be particularly tender and tasty. But before the little creatures

were killed, I photographed them from various positions. One stood 35½ inches high, the other 35¾ inches. The head was disproportionately large, and the legs absurdly long in com-



Two Views of the Wild Ass Foals.

parison with their body; but then the latter are in their case the limbs which are first used, as well as those which are of the greatest importance to them. The body was very short

and compressed, and gave scarce any indication of the noble and harmonious lines which distinguish the full-grown kulans. The little ones we had in captivity were too young to be afraid of human beings, or of the camels or the tents; but had they been a week older, they would neither have let themselves be captured nor would they have been at liberty without making attempts to escape. When we gave them a finger, they sucked at it greedily, a proof that they were hungry.

During the night of the 26th of July the temperature fell to only 1½° above freezing-point, though the following day was beautifully warm. These latitudinal or parallel east-west valleys, which of course are, relatively speaking, the lowlands of the elevated regions, have, as a rule, a more temperate climate than the higher mountainous parts.

Next day we still continued westwards, riding close to the edge of the belt of sand, and having on our right all day long an unbroken succession of marshes, morasses, and pools, all more or less connected, or, at any rate, linked together, by small channels or watercourses. They were surrounded by luxuriant grass, but the ground was extremely treacherous, and even dangerous; it would not bear so much as a man's weight. Some of these depressions were a couple of hundred yards long. All of them were fed by subterranean springs, which trickled underneath the sand, and lower down they became united into a single stream, which entered the Kum-köll at its eastern end. Six of these rivulets were of considerable size, and one of them carried as much as 70 cubic feet in the second, the water, after filtering through the sand, being as bright as crystal.

We kept a good look out for the lake, and at last saw it gleaming like a silvery ribbon in the west. The day was warm and still, and the mosquitos troublesome. Moreover, a species of gad-fly called *ila* tormented the horses, and made them nervous and restless by getting into their nostrils. The kulans protect themselves against these insects by keeping their nostrils close to the ground when they graze, the orongo antelopes by spending the hot part of the day deep in the belt of sand, and by coming down to the grazing-grounds in the evening only. The yaks protect themselves in the same way, but go higher up in the sand, so that we did not get a glimpse of them all day, although we observed their foot-prints and droppings everywhere. At four o'clock a violent squall of hail and rain came on, and the yaks, which knew this would banish their enemies,

made their appearance in little companies on the crests of the dunes. First appeared a cow with her calf, glissading down the steep slope; but upon catching sight of us, she turned tail about and went back. After that a herd of over 30 arranged themselves in a line on the top of a high sand-dune, and fearlessly stood watching the caravan. I stopped and observed them for some time through my field-glass. The wild yak is in truth a magnificent animal. The herd stood out with remarkable distinctness, black as coal, against the yellow background of the sand. They were on their way down to their grazing-ground beside the lake, when they found themselves thus cut off from it by our caravan. We could almost see them literally rejoicing in the refreshing rain, which patter-pattered on their shoulders. The yaks that live in this region always graze all night, but at sunrise return up amongst the sand-dunes, where they remain until it gets dark, or a storm tempts them down again.

The slopes of the sand-dunes were deepened in colour by the rain. You would think that a violent downpour such as that was would convert them into soft mud from end to end; but it did not even affect the sharp outlines of their contours, and only formed little shallow pools on the surface. The sand gradually decreased in height as well as swung back from the middle of the valley. We now had the lake on our right; its southern shore extended 60° west of north. Here 14 big yaks were already grazing. Cherdon, who rode with me, could not take his eyes off them, and at last begged that he might try his luck. He crept as stealthily as a cat towards a powerful bull, which simply stood still and looked hard at him without showing the slightest trace of fear. Cherdon did not like the look of him, and thought discretion the better part of valour. I had warned him to be careful when hunting yaks, and not to go after them alone if he could help it; for when a yak is wounded, he will often turn and attack his hunter.

A little bit further on Cherdon caught sight of a solitary wolf-cub, four months old, and galloping after it, managed to catch it. Upon reaching camp, he tied up his captive; but the dogs showed the greatest possible indifference to it. The men, however, bestowed upon it all the most endearing epithets they could think of; they had not forgotten the nine sheep which the wolves tore to pieces. Tokta Ahun warned me to keep good watch upon the sheep; for the she-wolf, which

no doubt had her lair somewhere close by, would not lose sight of her cub, and if any harm came to it, she would take her revenge upon the sheep. He had twice caught wolf-cubs himself, and on both occasions the older wolves had killed an ass of his. Wolves will not try to meddle with full-grown kulans, because they could never catch them ; but they will sometimes chase the young ones into soft marshy ground, and then bite their throats till they kill them. We intended to take our young wolf-cub with us, and try to rear it ; but it proved too cunning for its captors. During the night it gnawed the rope through, and ran away with a piece of it round its neck. The Mussulmans hoped that as the beast grew the rope would throttle it ; but I thought it more likely that its mother would gnaw the rope away before that.

Camp no. XVI., beside the Upper Kum-köll, which lay 12,737 feet above the level of the sea, was all that could be desired. We had plenty of grass, and plenty of fuel, and the water in the lake was fresh. On the north the imposing range of the Kalta-alagan stretched its rugged sharp-cut spurs down into the valley, and itself extended as far to the west as we could see. The mountains on the south were, on the contrary, entirely enveloped in clouds. The next morning my little boat lay ready screwed together on the shore ; so taking Kutchuk with me I sailed across the lake before a steady breeze. We carried with us the yurt and such instruments as I required for my cartographical work, for taking soundings, and so on. But before we got very far from shore, a sudden squall snapped the sail yard, and we were forced to row back and mend it, by lashing the ends together and strengthening the fracture with pieces of tamarisk wood. Then we steered for a snowy peak which lay 13° east of north. This lake was shallower than I had expected to find it ; its greatest depth only measured 12¼ feet. We landed on a little gravelly island about 35 yards in diameter near the northern shore.

The sky in the east now began to assume a threatening aspect, and the valley filled with dense clouds, while columns of rising sand were driven like smoke across the sand-dunes. Accordingly, we thought it best to wait a little ; and sure enough, down came the storm. We sheltered ourselves as well as we could against the driving rain by crouching behind the boat. But although the lake was alive with big, foam-crested waves, I could not resist the temptation of dropping the sail and

pushing off. We had, however, to exercise the utmost vigilance, for the flat valley acted like a funnel for the wind, which thus swept the lake with unmitigated fury. We kept as well as we could to the crests of the waves, so as not to get filled with water. But the gale increased in violence, and the mast threatening to break, I at last called to Kutchuk to furl the sail; but even under bare poles we went along at a spanking pace before the wind. I was only able to get an occasional sounding, we travelled too fast; but I easily managed to obtain the velocity and also took my compass bearings.

In this way we soon reached the western end of the lake, and found that it contracted into a little stream, which carried off its superfluous water, and emptied it into the big salt lake of Ayag-kum-köll, or the Lower Sand Lake, which lay further to the west, and which we shall encounter again on another excursion. Here the Kum-köll was very shallow, its depth seldom exceeding 3¼ feet; while the shelving southern shore was continued by mud-banks, over which the water was stained black after being stirred up by our paddles. This part of the lake swarmed with wild-duck and wild-geese. The latter were sitting on their eggs, and unwilling to fly far; but they were all the cleverer at diving, as we soon found out when we tried to row down a flock and attack them with our paddles.

But our return was nothing like so glorious as our departure. We paddled our hardest; but the wind freshened again, and after a while it began to rain, so that we got wet through, a result to which the waters also contributed by occasionally washing over us. At length, however, we perceived the tents, though still a long way off; in fact it took us two or three hours longer to reach them. I was always unlucky in my lake excursions; no matter how fine the weather was when I started, it always came on stormy before I got back.

CHAPTER XXXI.

ACROSS THE ARKA-TAGH.

On the 30th of July I sent Tokta Ahun and Musa, with six horses, back to the headquarters camp, although this made the loads somewhat heavier for the animals that remained behind. Besides myself, our strength now consisted of six men—Cherdon, Turdu Bai, Mollah Shah, Kutchuk, Niaz, and Aldat—seven camels, 11 horses, one mule, five sheep, and two dogs. The day's march ran to the south-south-west through open monotonous country for a distance of 23 miles. In the morning the basin of the Kum-köll was enveloped in a moist, impenetrable mist, and the range of Kalta-alagan had entirely disappeared. The air was warm and still, and full of mosquitos, which faithfully followed us all day. We longed to reach altitudes where these wretched creatures could not live, and once there we should not return to their native habitat until they were all perished in the winter cold.

The surface of the Kum-köll glittered like plate-glass, but we soon lost it in the mist behind us. In between the dunes, which jutted out like headlands into the valley, we found firm ground, and a series of small basins, each containing a pool of saltish water. When the sand-belt came to an end, we travelled over a gently undulating surface, with patches of grass here and there, until we reached the stream known as Pettelik-daria, which was enclosed between scarped terraces of loose yellow earth. This stream, which flowed due north-west and issued into the lake of Ayag-kum-köll, had a volume of about 353 cubic feet in the second, and a maximum depth of 2½ feet. But Turdu Bai and Mollah Shah, in trying to find a suitable crossing-place, nearly perished in the mud at the bottom, man and horse together. Barely a tenth part of its bed was now under water, but the moisture still clinging to its sides showed that it had

recently been full to the brim. It would then have been quite impossible to ford it.

The next day's march, our fourth at these sublime altitudes, took us to the south-south-east, and was equally as long as the preceding stage. After fording the river once more, we found our road blocked by a minor range, probably a spur of the Arka-tagh. The atmosphere was again clear, and in the east-south-east we saw the glittering, snowy mass of Chullak-akkan, which we had first observed from the pass of Avras. The belt of sand still continued on our left hand. These dreary steppes were haunted by innumerable orongo antelopes; but in spite of all their endeavours our hunters failed to bring one down. This country was sometimes visited by gold-seekers and yak-hunters, and this had taught the animals to be on the alert, so that they took very good care not to let us approach too close to them. We were now at the end of Aldat's geographical knowledge. He had never been so far south before, nor any of the other men either; so that for the future I had to take the responsibility of guiding the caravan myself.

We directed our course towards a notch in the mountain-chain, up to which a promising glen appeared to lead. But when we entered it, we found it was destitute of water. However, on the right hand, that is to say, the west side of the glen, in an elbow or recess, we discovered a little fresh green grass, and a small spring, which yielded enough water for our wants.

On the 1st of August we did eighteen miles to the south-south-east. On the whole we travelled towards the south, because I was anxious to cross these successive mountain ranges at right angles, and, in addition to geographical observations, to gather also material for a geological profile. My plan was to get as far south as I possibly could, and only turn back when our supplies were half exhausted. In making this calculation I deliberately left one important factor out of account—namely, that on the return journey the animals' strength would become so reduced that they would travel very much slower, and consequently take a longer time. I did not overlook this; but the main thing was to penetrate as far south as I could possibly get. We could somehow or other manage to pilot the caravan home, and if the worst came to the worst we could walk ourselves. I hoped we might have to turn back in a region where there was plenty of grass, so that the animals could obtain a good rest before starting. But I had no conception what a strain the

return journey would put upon them, and what trouble it would cost us to get the remnants of our caravan safely home again.

It proved no easy task to force a passage over the granite wall which now towered up across our path. Although it took the whole day, we managed it successfully at last. It was a parallel range of the Arka-tagh. After groping our way up to the watershed of this new range through winding gorges and glens, over spurs and secondary passes, we beheld, upon reaching the main pass at the top, a stupendous range, black as ink, but capped with snow. This I took to be the Arka-tagh, the same difficult mountain-range which I encountered in 1896; and I feared we should have as tough a job to get over it now as we had then. We pitched camp beside a little brook in the longitudinal valley at the foot of this new mountain-wall, at an altitude of 15,217 feet above the sea.

It had been a splendid day, and we had not been molested by either mosquitos or gad-flies. But at seven o'clock the rain began to patter on the yurt; and when I stepped outside, the whole landscape was steaming with rainy mist, and not a mountain visible. The horses stood tied together in pairs, with their heads hanging down; they were half asleep, and the raindrops ran down their sides and drip—drip—dripped from their pack-saddles and manes. The camels crowded together in a clump, to keep themselves warm, and in spite of their heavy breathing they seemed to enjoy the rest. The camp-fire was smoking in front of the men's tent, and whilst Cherdon prepared my dinner, Mollah Shah got the men's ready. After a while Kutchuk and Niaz turned the horses out to graze. We left them out all night, but told off a watchman to give an eye to them, to see that they did not stray too far. The camels could not see to eat before daybreak, and therefore lay where they were all night; but we gave them a few pecks of maize for their supper. Yolldash took very good care not to venture out in such very disagreeable weather, but lay curled up inside my tent. Malchik had a sore foot, and during the last day or two had been packed on a camel's back, where, with the skill of an acrobat and a certain degree of elegance, he adapted himself to the cradling movements of his "steed." With the rain falling like slanting arrows in the darkness outside, I was very glad to creep back into my well-lighted yurt.

We stayed where we were all the next day, for I wanted to take an astronomical observation—a process that is very trying

The Caravan Resting whilst Cherdon was Looking for a Pass (3rd August, 1900).

to the patience when you are continually interrupted by passing hailstorms and flitting clouds. The morning did not look very promising. It had snowed ever since midnight, and continued snowing until about nine o'clock, burying what little pasture there was under a white sheet, so that, although our animals were groping about all day, they came home at nightfall only half satisfied. The mountains exhibited a variety of colouring: sometimes the snow-fields glistened intensely white against a background of dark clouds; sometimes the sky was clear in the distance, and the snow-fields assumed a cold, steel-blue tone, while heavy black clouds obscured the sun. Yesterday the perpetual snow, with its rudimentary glaciers, stood out in very sharp relief; to-day it and they were alike hidden under the white mantle of the fresh-fallen snow.

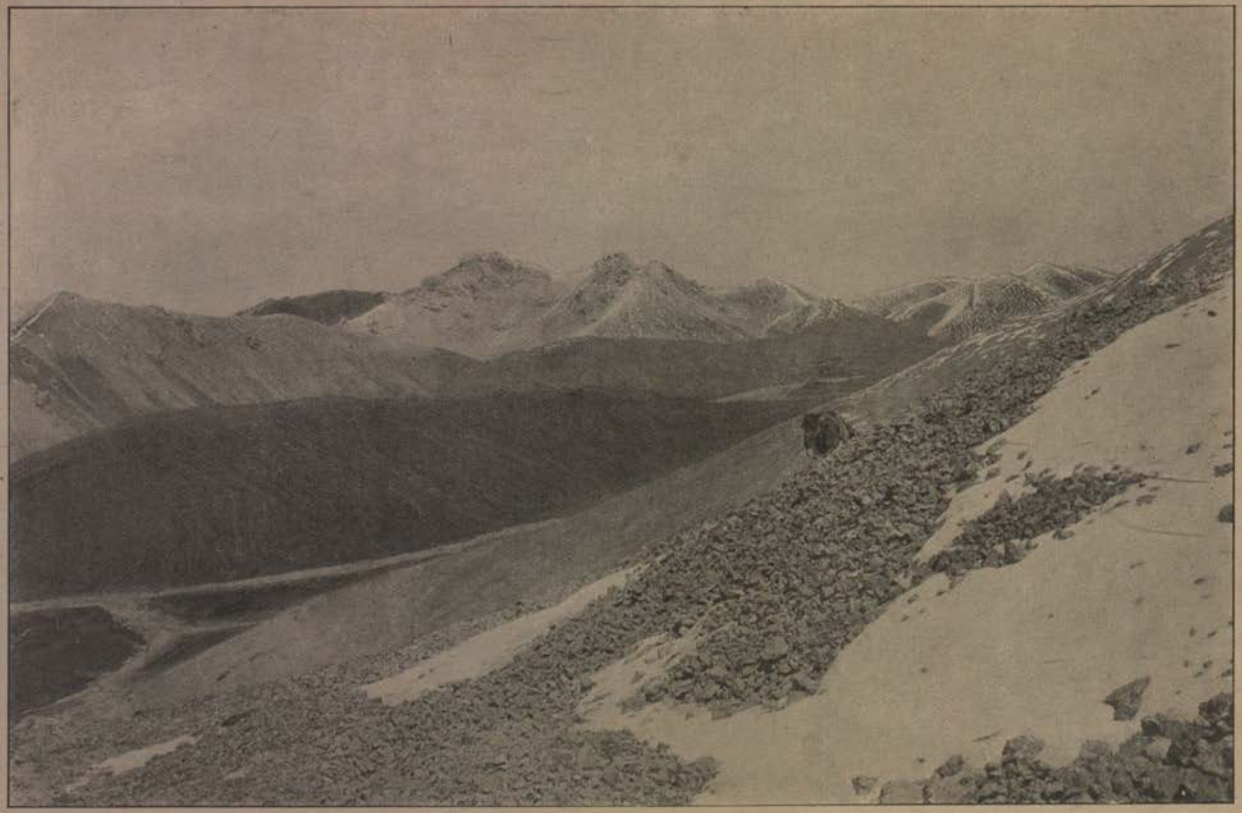
The night of the 2nd of August was the coldest we had had for some time; the thermometer dropped to $-5°.2$ C. or $22°.6$ Fahr. In the morning every pool and rivulet was covered with a thin sheet of ice, which, however, thawed in the splendidly bright weather that ensued, although in sheltered crevices it did not melt at all. To-day the animals showed the first symptoms of fatigue; one horse was allowed to go without a load, and one of the camels turned sluggish soon after the track began to ascend. We penetrated the next range at a point where it appeared to be lowest, and came eventually into the expansion of a glen in which were hundreds of orongo antelopes—big, beautiful animals, with horns that stuck straight up like bayonets. They sped swiftly and easily up the mountain sides, it apparently costing them no effort at all to exert themselves in the rarified atmosphere.

From this expansion two glens led off, one to the south, the other to the south-west. We chose the former, for it had a little brook running down it. But it soon narrowed and grew steep, and at the head of it a snow-clad mountain towered up like a wall directly in our path. As our advance in that direction appeared barred, I sent Cherdon on to reconnoitre, and whilst we were waiting for him to return, I took a couple of photographs. He soon came back, however, and said that it would be impossible for the camels to get through that way; so we tried the other glen. Then, whilst the caravan was making a detour round a steep spur, I rode over the top of it with Cherdon, and found it equally steep on the other side. From the top we perceived forty or fifty antelopes grazing on an acclivity not very

far away, and made signs to the men with the caravan to drive them into the corner where we were waiting. But they were too knowing for us, and going off up the glen, were speedily out of sight.

The glen soon turned to the south-south-west, and ran up towards a pass which was free from snow. I rode on ahead. The ascent was dangerously steep, and on the top of the pass—the highest point we had hitherto reached, namely, 16,280 feet—I had to wait half-an-hour while the rest of the caravan struggled slowly up the débris-strewn slope towards me. The prospect on the other side was anything but encouraging, a chaos of rocky pinnacles, mountain-spurs, and snow-capped crests extending away to the south. It was plain we were not yet at the summit of the Arka-tagh—we had merely crossed one of its many parallel chains which run from east to west, and consequently still had the worst obstacle to surmount.

At last the others scrambled up to the top of the pass beside me. The poor camels, their legs actually trembled under them! Their nostrils were widely distended, they wanted more air; and their eyes turned with a weary and indifferent look to the south, as if, amid this universe of barren, naked mountains, they had abandoned all hope of ever getting a good feed of grass again. From the summit of the pass we zigzagged down between the craggy headlands into a gorge which led to the south-south-west, and was itself cut through solid rock of black slate, porphyry, and diorite. Moss was the only thing that grew beside the brook which traversed it, until we came out upon the broad longitudinal valley into which it issued. There there was some *yappkak* scrub, which the men gathered for their evening fire. This valley was drained by the biggest stream we had encountered since we left the Tarim; it was 213 feet broad, had a maximum depth of 23½ feet, and carried 954 cubic feet in the second. It appeared to have its source in three large rounded mountains, which stood side by side like three-cornered hats in the east-south-east, and flowed towards the west-north-west. Its left bank was twenty-five to thirty-five feet high, and vertical—an obstacle which we should have been unable to surmount had it not been for a little side-ravine which led up to the top of it. After that we struck into a transverse valley, and, entering a glen on its southern side, encamped in open ground beside a little tributary of the big river, at an altitude of 15,693 feet. A little higher up we saw thirteen big black yaks grazing.



View from the Pass, Looking 80° East of North (3rd August, 1900).

They did not at first perceive us, but as soon as we stopped and began to pitch the tent, the leader of the herd caught the alarm and off they all went in a body towards the Arka-tagh, whose main crest did now really loom up before us in all its gloomy majesty. Once safely over that, the country beyond ought to be fairly open.

The next day we decided to rest, so as to give Cherdon and Aldat an opportunity to reconnoitre the nearest glens leading over the Arka-tagh. They reported that the glen in whose mouth we were encamped was impassable; and so, on the 5th of August, we proceeded a good bit down the latitudinal

One of the Parallel Ranges of the Arka-tagh—Seen from Camp no. XIX.

valley, until we came to a deep-cut watercourse, with a large stream flowing down it. Here, where we turned south again, I stopped for a short time to enter the main geographical features on my map. From that point the latitudinal valley extended as far west as I was able to see. But some distance down I observed a transverse valley or breach, where the river probably cut through the range which we had crossed over the day before. My point of observation was situated a long way above the bottom of the valley, and offered a panorama that was overpowering, both because of its gigantic dimensions and its sublimity. The river, split into several arms, wound through the light grey mountain débris, interrupted occasionally by large sheets of ice.

I could just hear the murmur of the water. The spurs of the Arka-tagh lay like sphinxes looking towards the north, with their stony paws just hanging in the stream. But the desolate beauty of the landscape was soon veiled in clouds and steaming rain. Turning our backs upon the scene, we resumed our toilsome march up the glen, the air in which was cold and raw.

The east side of the glen was bounded by a range of snow-clad mountains, but the opposite side was more open. However, it soon came on to rain and the wind blew hard. Then while we made haste to run up the tent as fast as we could, Mollah Shah rode on further to ascertain where the glen went to. If there was no practicable pass, we should only tire the animals to no purpose by proceeding with the whole of the caravan. Even as it was, our animals were beginning to lose flesh. Cherdon's black horse refused to eat, and looked in a bad way, which distressed the poor fellow a good deal, for he was passionately attached to the animal. He had trained him splendidly. When he called him by name, the horse came and put his head over Cherdon's shoulder. The little Buriat Cossack was quite an acrobat. Whilst his horse was moving, he would stand on his hands on the saddle, play at leap-frog over his hind-quarters, and turn somersaults across him without the animal being in the least degree startled by these performances. No wonder, then, Cherdon tended him as the apple of his eye, and was very much distressed to see him ailing. Our four remaining sheep were extraordinary animals. They followed the caravan like dogs, climbed the steepest slopes with ease, and appeared to be perfectly satisfied with the scanty and miserable grass we found for them.

By this we had become accustomed to the extraordinary altitude. So long as I sat still in the saddle or the tent, I did not notice any difference; but the least exertion, such as chipping at a rock with a geological hammer, occasioned shortness of breath and accelerated action of the heart. It was, however, a great advantage to be freed from the attentions of the mosquitos and gad-flies. In place of them we had a species of gigantic humble-bee, which, when the sun shone, came out and sailed through the air, humming like the bass notes of an organ. It was specially equipped for the intense wintry cold of these regions, being clad throughout in coat and greaves of thick yellow hair.

As there was not a scrap of pasture at this camp, it was

The Pass of 3rd August, 1900, Looking North.

useless to turn the animals out. Although it was scurvy treatment, all we could do for them was to give them a shower bath of commingled water and ice, instead of food.

Mollah Shah came back after an absence of six hours, and reported that the pass in which our glen terminated was practicable. But what it was like on the other side he did not know, for the view was obscured by a driving snow-storm. And, indeed, when we left that inhospitable camp next morning, the whole country was once more shrouded in snow. But as the morning wore on, the sun peeped out, and the snow began to melt. The glen led by a slow, gradual ascent up to the pass. Its bottom was strewn with black, slaty débris, which crunched under the horse's hoofs; and down its middle ran a bright, cheerful little brook, picking up a number of smaller tributaries on each side as it proceeded.

The pass formed a rounded, flattened saddle, which even the camels surmounted without any special difficulty. With the help of the camera-stand I made a little temporary shelter for the boiling-point thermometer, and found the altitude was 16,996 feet—thus we were standing on the highest *mountain-chain* on the face of the earth. At our feet stretched the latitudinal valley which I traversed in 1896. Immediately on the other side of it was a stupendous mountain group crowned with perpetual snow and *névés*, with short glacier arms radiating in every direction; seen from a distance it might be compared to a starfish. On its northern face were three broad truncated glaciers, with enormous terminal moraines of black débris. Of the naked rock itself there were only a few black and brown pinnacles visible; all the rest was buried under ice and snow. Each glacier-arm gave birth to a little rivulet, which ran down and joined the river that drained the valley from east to west.

After we had thus for several days been struggling up to higher regions, it was quite a treat to go down again. The animals travelled more easily, and we were buoyed up by the hope of finding grass in some hollow or other. Thus we swung at a good pace down the transverse glen which led from the pass to the next valley below. Near its lower extremity Aldat surprised an orongo antelope, and brought it down with his clumsy, primitive muzzle-loading musket. It proved a welcome addition to our larder, and enabled us to grant our three remaining sheep a few days longer reprieve.

Instead of continuing right down to the river at the bottom

of the valley—its banks looked grey and sterile—we turned to the west, and encamped on a gentle declivity where there was a little thin grass. Here Aldat managed to bag a big orongo, which put us all in better humour, for this supplied us with meat for several days. At these high altitudes rice did not make a very appetising dish; the "pudding" baked into a tasteless dough, and we did not want to kill our sheep until we were really forced to do so. Unfortunately Cherdon had only brought a small supply of cartridges with him, and had used them up too lavishly at first; so that for the future we were compelled to rely upon Aldat's gun. He, fortunately, had a sufficient supply of ammunition.

On the Summit of the Arka-tagh, 16,996 feet above Sea-level.

CHAPTER XXXII.

ON THE TIBETAN HIGHLANDS.

THUS we had at last climbed the gigantic wall which Nature has built up like a bulwark to guard the secrets of Tibet on the north. We had long left behind us the paths of the half-civilized yak-hunters and fatuous gold seekers, and plunged into a region which was an absolute *terra incognita*, except that I should cross my own former route, Wellby's, Rockhill's, and Bonvalot's each at a single point. As I had now exhausted the topographical knowledge of my guide, Aldat, my map from this point embraced only a narrow belt on each side of our actual route; but I hoped in the future, that other routes which I proposed to take would enable me to obtain a clear conception of the orographical structure of the region.

I had always plenty to do from morning till evening. Leisure moments were few, and such as I did get I spent in reading Geikie's *Great Ice Age*, Hann's *Klimatologie*, and Kern's *Bhuddismus*. Although we led the lives of dogs in this country, which was as desolate as the moon is supposed to be, yet we reaped more than an equivalent reward in the discoveries and observations which we made from day to day. It was a delicious feeling, to know that we were the first human beings to tread those mountains, where there existed no path, where there never had been a path, and where there was not a foot-print visible, except those made by the hoof of yak, antelope, or kulan. It was a no man's land; rivers, lakes, and mountains were all nameless; their shores, banks, and snow-fields had never been seen by any traveller's eyes but mine; they were mine own kingdom of a day. It was delightful—it was a great thing, to cruise, like a vessel that leaves no track behind her, amongst those upswellings of the world's "high sea," to make our way over those gigantic mountain waves. Only the waves which

roll across the Tibetan highlands are petrified; and all distances and dimensions are cast on such a gigantic scale, that you may march for weeks at a time and still find the situation unchanged—still find yourself the centre of a universe of mountains. And it was just as wonderful to live up amongst the eternal storms, those insurgents of the atmosphere, which drive across the howling mountain wastes and set their swift-moving batteries—namely, showers of clattering hail—to play upon the mountain sides.

That night when I stepped out of my tent the sky was mantled with clouds, their edges tipped here and there with the silvery rays of the moon. The wide-spread glaciers, out in the open, were flooded with the pale, frigid moonshine. The men were all asleep, the caravan animals safely tethered, the fire extinguished; and the only sound that disturbed the solemn hush of the night was the little brook murmuring its pensive song amongst the flaky shales. The night was keeping its silent, solitary watch over the mountain wastes, and all around it flitted the ghosts of a multitude of questions and problems craving their answers. Far away in the south I pictured to myself the crests of the snowy Himalayas, and beyond them again India with its stifling jungles. In the west our mountains linked themselves on to the Pamir highlands, and by the time the sun rose here, he was already pouring a flood of brilliant light over the kingdom of the Middle and its mountainous western borders. With the north, where lay the heart of Asia, we were to some extent familiar; but, here in Tibet, we were alone in an unknown land. In vain did we strain our eyes for a glimpse of a fire or the footprint of a human being; we had reached an uninhabited and uninhabitable part of the earth. I felt like an atom of dust in the midst of the illimitable wastes, and fancied I could hear the swish of the planet as it rolled without rest, without cessation, along its everlasting orbit.

On the 7th of August we went on down the latitudinal valley, in the hope of finding one of my lakes of 1896. It was now all over with Cherdon's horse: he kept falling, and had difficulty in getting up again. But, as his appetite remained good, we did all we could to save him. Cherdon treated him in the Mongol fashion; that is, he bled him at the tips of the ears, and cut away a couple of pieces of glandular connective tissue in his eyelids. This seemed to revive him a little, and he managed to go longer stretches at a time. At first I thought

Camp no. XXVII.—A General Drying. The Men, going from Left to Right, are—Aldat, Niaz, Kutchuk, Mollah Shah, Turdu Bai, and Cherdon.

it would be best to kill him; but as Turdu Bai was of opinion that he might be saved, I ordered Mollah Shah to lead him slowly after us, whilst the caravan pushed on at the usual pace. As we failed to find a lake, I determined to wheel south again, and cross the mountain-chain which stretched west from the glaciated mountain group already spoken of. The latitudinal valley we were traversing was rather narrow, its stream very nearly dry, and on the south side, immediately underneath the moraines, was a belt of drift-sand, piled up precisely as it was beside the Kum-köll, into big dunes, which were very often detached from one another. They were regularly formed, and crescentic in shape, with their steep concave slopes toward the east. Within the arms of two or three of them were small crescentic pools formed by the melting glacier-arms. We forded several of these little brooks, the water of which was red and muddy. One of them had a volume of as much as 106 cubic feet in the second. The water in the pools, however, was transparent, and of an intense ultramarine blue colour, making a striking contrast to the yellow sand. We encamped beside one of these little brooks, close under the western shoulder of the glaciated mountain group, which we were thus half-way round. The grass, however, was worse than usual.

Mollah Shah came up five hours later. He had left Cherdon's horse a couple of miles from camp, neither better nor worse than in the morning. But when Cherdon went to look after him the animal was dead.

Turdu Bai rode up a transverse valley through the range which we were now about to cross, and returned in the evening with the report that the pass was not dangerous, and there was a big lake over on the other side of it; but he had not seen any grass. The ascent next day was smooth and gradual, and the pass occasioned us no exceptional difficulty, although one of the camels gave up, and had to be relieved of his load. From the top (16,805 feet) we had the same characteristic scene which our eyes had so often rested upon before—namely, immediately below us a latitudinal valley running east and west, backed by a mountain-range covered in part with perpetual snow. This latter was, I concluded, identical with the Koko-shili mountains. The bottom of the new latitudinal valley was in great part filled with a new lake, prolonged both east and west. The caravan had, as usual, a good start of me; but instead of going straight down to the lake, they swung off a good deal

to the west of it. This they did, not only in the hope of finding grass, but also that they might avoid the soft and treacherous strip of alluvium which encircled the lake. We encamped for the night at its western extremity, our Camp no. XXIV. (alt. 16,497 feet), counting from Abdall, being the very worst we had yet chosen. There was not a blade of grass, nor a scrap of fuel of any description; and we could only obtain a little hot tea at the cost of breaking up a packing-case. All that the beasts got was a handful of maize each. Scarcely was the camp settled down when a furious tempest burst upon us from the west. It began as rain, then turned to hail, and finally came down a regular deluge, until the felting of my yurt was sodden, and the rain dripped through upon me. Then during the night it changed to snow. The camels were just shedding their coats, and shook with cold, so we threw two or three felts over them. It was interesting to note that the new hair grew faster up here in the mountains than it did down in the warmer lowlands. Thus wonderfully does nature adapt herself to her surroundings.

The new mountain-range appeared to be low and easy to cross at a point south-west of our camp. Indeed, in comparison with the many which we had already crossed, we believed it would be a mere trifle. Its northern slopes were not even hard rock, but consisted only of low, rounded hills, which we never anticipated would occasion us the slightest trouble; but in reality this proved to be the most difficult bit of country we had yet encountered. In the first place, it was by no means easy to reach the foot of the hills, for the ground was everywhere marshy, necessitating the utmost caution to keep the horses out of the worst pitfalls, into which they sank up to their withers. But we assumed that, once we did reach the foot of the slope, the ground would be hard, and would bear us as usual. And at first the going was indeed not bad: the surface consisted of yellow clay, littered with stones and flakes of shale, and the ascent was easy. The only difficulty we experienced was with one big camel, which had a rooted antipathy to passes of all kinds, and which simply lay down at the foot of this. We left Turdu Bai to bring him on. Upon reaching the top of the first ridge, we continued along its crest to the south-east, having a deeply-eroded escarpment on each side of us. I led the way in the tracks of a wild yak, which went at first over firm ground, but higher up disappeared into the soft rain-drenched mire, which splashed at every step my horse took. At last he dropped in to such a

depth, that I thought it better to get off and lead him. I ought, of course, to have turned back; but the next ridge looked so enticingly near. When, however, one of my boots stuck fast in the mud, I thought it really was time to stop, and wait for the others. The men came up panting. The camels, patient and submissive, as they always were, struggled along in their wake, sinking in a foot or more at each step; and yet their broad, flat pads were better than the horses' hoofs. One of the former fell, and we had to unload him, get him up, and reload him.

Walking on a veritable quagmire like this, at such a high altitude, completely took our breath, and made us feel quite giddy. Nor did we get on any better when we used as stepping-stones the big pieces of flat slate which lay scattered over the bog. For when we stepped upon them, they too sank into the ground, leaving a little pool of water where they had been. We could hear the water bubbling and trickling under the débris; so that I almost fancied we were walking over a subterranean river, which might suddenly open and engulf the entire caravan. I could not help thinking that the whole bunch of hills would, like a viscous fluid or thick porridge, gradually flatten themselves out to a uniform level. This conformation was caused by the incessant precipitation searching into the ground and making it like a sponge; for only a very small quantity trickled into the superficial brooks and rivulets, and so flowed away. The absence of vegetation with its interlacing roots also contributed to the same result. In two or three places the shales stuck up edgewise and cut the camels' feet. In one place two of the horses would have been literally smothered in the oozy mire, but that we hurriedly freed them from their loads and hauled them up. As the situation became at last absolutely intolerable, I sent Cherdon on to reconnoitre. He came back and said that this ridge was the first of a whole series, which extended a long distance to the south, and that all were flecked with melting snow, which of course would make the going even still more difficult.

This was the signal to return. We had lost more than four hours over this wretched piece of road, besides climbing up to an altitude of 17,219 feet to no purpose whatever; but the worst was that we had taxed the animals' strength severely, and all to no avail. After a little search we found a natural watercourse, or gully, and descended actually in the brook which traversed it—the only direction in which the ground was firm

enough to bear us. But upon reaching the latitudinal valley at the bottom, the ground there proved to be not a whit better than it was higher up. Several other brooks poured into the one we were travelling down, until the united stream swelled to a volume of 283 cubic feet in the second. Coming at length to a patch of grass on its right bank, at an altitude of 16,441 feet above sea-level, we encamped, and decided to give the animals—what they sorely needed—a good two days' rest at Camp no. XXV.

A queer sort of rest it was, too! The morning. it is true, was promising enough; but just as I was going to take an observation of the sun, the sky clouded over. A little while after that the men carried out my bed, and felts, and carpets, and had just got them hung on the ropes to dry, when the sky blackened in the west. In we bundled all our belongings again as fast as we could, and had barely finished when down came the hail, rattling and crashing about our ears like bullets. This over, I managed to obtain my solar observation, but had scarcely finished when I saw a new storm advancing, quite as black as the former, but seven times more violent. It was preceded by furious squalls, upon which followed hail and wetting snow. I have seldom seen worse weather in Tibet. It thundered and lightened several times in the minute, and both thunder and lightning were quite close to the surface of the earth, immediately above our heads. The reverberations of the thunder were like mountains being cleft asunder, or mountains crashing flank against flank. The dazzling lightning made us involuntarily flinch, and we actually felt the ground trembling under our feet when the thunder crashed. It was a solemn and awe-inspiring sensation to be in the very centre of such a convulsion of nature, exposed to its uncurbed violence. We stopped working, we watched it, we listened to it, we wondered. The dogs howled pitifully. The men's tent was torn open, and it was as much as they could do to get it fastened again. The landscape was sheeted with hail and snow, underneath which the poor hungry horses had to seek their niggardly sustenance.

The second day proved, however, better: the sun came out and melted the snow, and the hail-storms kept off until five o'clock in the afternoon. One camel and one horse showed signs of exhaustion; and when, on the 12th of August, we continued, towards the south-east, over the "mud-range," Turdu Bai went on ahead, with the two sick camels carrying

no loads; although this of course made the loads of the others all the heavier. In spite of that, however, we soon passed him, for he was travelling terribly slowly, owing to the big pass-hater wanting to lie down and rest so frequently.

On our left we now had a chain of mud-hills; in the far distance on the right a string of reddish eminences, while the ground between the two ascended imperceptibly towards the south-east; but there were no high mountains immediately in front of us. The ground we were travelling over was, however, abominable—one gigantic morass of yellow plastic mud, saturated through and through like a sponge. Although covered in places with a thin sprinkling of gravel, which looked tolerably firm, the animals nevertheless sank in up to their knees at every step, and as each foot had to be drawn in turn out of the tenacious, adhesive mire, it was very exhausting work to get on at all. The surface was, in fact, so soft that no sooner was a deep foot-print made in it than the ooze closed round it and filled it in again. It was a piece of exceptional good fortune when the animals did not sink in more than four inches, and we were glad for their sakes when we came to comparative oases like this in the midst of that interminable slough of despond. But our joy was always short-lived: they were soon in again up to the knees, stumbling, falling, so that we had to unload, haul them up, and reload time after time. Truly an accursed land! That grass and fuel should be wanting at an altitude of 16,000 feet above the level of the sea was easy to understand; but why on earth should the ground not bear us? Why should it threaten to engulf the entire caravan? There was not a patch of dry ground as big as a threepenny-piece; it was everywhere saturated, sodden, through and through. In fact it was like the muddy bottom of a lake just after the water has been drained out of it. To tell the truth, I was astonished that our animals were willing to face it at all. I should have expected they would lie down and absolutely refuse to budge an inch. The big camel, that had such a rooted objection to passes, was quite right in refusing to exert himself. The heart of the Takla-makan Desert was not more destitute of organic life than were these truly abominable mountain wastes. Everyone of the men was obliged to walk. Our hearts beat as if they would burst, and we literally gasped for breath; while to climb into the saddle was like bringing the horse down over his own head. He moved as if he had

a stone's weight of sticky soil adhering to each foot, and was unable to complete his pace until he had kicked it off. I rode on in advance to see what the country turned to. But the baggage animals were shy of stepping in the actual foot-prints of the animals which preceded them, and preferred to strike out a fresh track for themselves, though this was really no positive advantage to them.

Thus we plunged on hour after hour. This country threatened to be our doom! Our advance was like that of an invading army, which has burnt its bridges behind it, and is in the midst of the enemy's country, surrounded by dangers on every side. And yet there was a peculiar charm in a rash undertaking such as this. The farther we went the greater obviously grew the difficulties we should have to encounter on our return; but it was just these difficulties which enticed us on. We kept wondering. Shall we overcome them? Yet never for one moment did we think of turning back.

It is a remarkable thing, that in such a relatively short distance as that which intervened between the Akato-tagh and this region there should be such a striking difference in the natural conditions. There we might travel a whole day before we came to a miserable spring; here we had only to stamp on the ground in any spot we chose, and instantly the print of our foot was filled with water.

In the south-west stood a small, conical, detached eminence, and between it and the muddy ridge on our left was a low saddle, the water-parting of this particular district. On the way up we met a solitary wolf, which, however, took to flight the moment it saw us. Here we lost the big camel which hated passes: he failed to reach the top of the saddle, and died before morning. We had just reached the summit (16,769 feet) when the usual storm came on, and the thunder rumbled like the rolling of the ball in a giant's skittle-alley, or like the firing in the bombardment of a distant fortress. Although it was only four o'clock, it was as dark as an autumn evening. The horses walked sideways to avoid the hail. We ran up our tents hurriedly on the south side of the conical hill, where, although the ground was muddy, there was nevertheless a little grass (16,654 feet); but before we had finished our work, we were all wet to the skin. The storm lasted two hours, then the sun peeped out; but we were in the shade, and the sunshine played on the hills in the east as if in mockery of us. As the earth was relatively warm,

The Glaciated Mountain-mass seen South-west of Camp no. XXVII.

the hail soon began to melt, and the men dug a trench round my yurt to draw off the water.

At last, on the 14th of August, the sun shone out. During the night preceding the thermometer fell to −3°.2 C., or 26°.2 Fahr., so that in the morning the ground was frozen hard, and the holes made by the animals' feet were covered with thin coatings of ice. But our mutual congratulations were short-lived. Before noon the surface turned as soft and spongy as ever. This day, however, we managed to turn our backs upon this abominable range, which had cost us so much trouble. From the easy rounded saddle by which we crossed it, we saw below us yet another latitudinal valley, shut in on the south by yet another lofty range. In the south-west was a vast glaciated mountain-mass; in the south-east a lake, and behind the latter the contours rose up into snow-clad heights of great altitude. The lake was fed by a stream which came from the west. Higher up the valley, that is towards the south-west, the ground assumed a green tinge, and accordingly we steered our course towards it; for grass was the thing we now needed most.

Upon reaching the place, we at once halted, for the ground was dry, firm sand, and it was quite a pleasure to see how the animals brightened up when they found themselves amongst the grass. Thin and sparse though it was we spread out all our bedding and every felt we had on the sand to dry in the blazing sun; but the tent and the yurt dried best erected in the usual way.

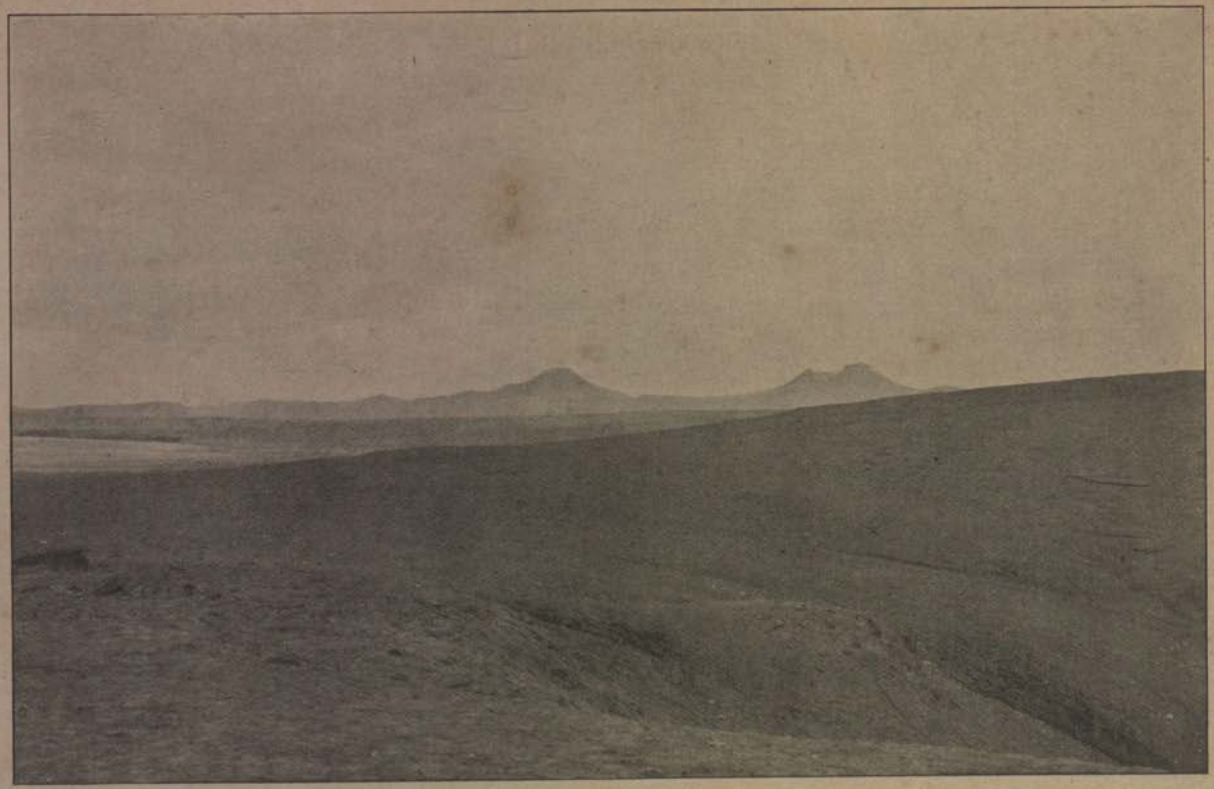
The next day, the 15th of August, it was exactly fifteen years since I started on my first journey to Asia, and I thought that the best way to celebrate the anniversary would be to take a day's holiday in this hospitable spot; and I was glad we did, when I saw how the animals picked up. Although it rained for a couple of hours, the weather was, on the whole, fine, and the thermometer went up to over 15°.0 C., or 59°.0 Fahr. This was a veritable oasis in the dreary mountain wastes, and as both animals and men visibly gathered strength, I agreed to give them yet another day. The men really had nothing else to do except bake bread, wash their clothes, and collect fuel, which they obtained from a little plant called *yer-baghri*, which put forth bunches of leaves on the top of a dry stalk.

On the 17th of August we started to climb over the next mountain-range, fording on the way the stream which flowed down the valley from the glacier in the south-west, and which

carried from 250 to 280 cubic feet in the second. We began the ascent in a transverse valley, which our animals soon began to feel. After crossing three secondary passes, we reached the main pass, which was flat, and had two pools on the top. On our right, that is in the west, was the mountain-mass sheathed with glaciers and snow-fields; in the east, a flat-topped mountain, the edge of which was as straight as if it had been drawn with a ruler. It was probably capped with the porous tuff which is so common in these regions. From the summit of the pass we descended by an easy watercourse through the red, rounded sandstone hills; but the glen soon contracted into a veritable ravine, which in two or three places was so narrow that we were obliged to scramble up out of it and climb over the hills at the side. Finally, we came out upon a glacier stream with a volume of 350 cubic feet in the second, the water of which was muddy, and reminded me of 'hip' (*nypon*) soup. As there was a little scanty grass beside the stream, and the sandy ground was at least dry, the caravan halted for the night. Here Aldat, in shooting at an orongo antelope, had the misfortune to break his musket by bursting off a screw, which nearly struck him in the face. But, fortunately, he found it again, and was able to fasten it on with wire and a leather strap, so that, in case of need, the weapon could still be used.

During the greater part of the next day it rained again, and rained all night until seven o'clock the following morning, when we again started down the valley. The stream flowed almost due south-east, at the rate of nearly $3\frac{3}{4}$ miles an hour, and we followed it for over $18\frac{1}{2}$ miles. We did not care where it took us, provided we got down to a lower level and found grass. Early in the day the men made a very unexpected discovery —namely, a piece of an old shirt, of Mohammedan make, a piece of rope, and a wooden pin with notches in it, such as is used in fastening a pack-animal's load. Whether these things were left by a caravan of Mongol pilgrims, or by Captain Wellby, I could not say. The latter, however, is not unlikely. Wellby and Malcolm crossed Northern Tibet from west to east—that is, from Ladak to Tsaidam—at the time I was in Tibet in 1896, their route running along the valley which lay immediately south of, and parallel to, my own route. A few years later Captain Wellby fell in the Boer war; where Lieut. Malcolm also was seriously wounded.

On the 20th of August we did 17 miles in a due south-easterly



View towards the South from Camp no. XXVIII.

direction, over slightly undulating country, with a gentle fall, where the going was excellent. In fact, the ground was, on the whole, so level that the water, instead of flowing off by any sort of distinct watercourse, collected on the surface in a vast number of little muddy pools. The grass gradually improved, until it was better than any we had hitherto found in Northern Tibet, and mingled with it were patches of luxuriant wild garlic, a herb which the camels ate greedily, and which also made a welcome flavouring in our soup.

The aspect of the region now changed entirely: it was open right away to the horizon. On the horizon there were, it is true, one or two mountain crests; but they appeared quite insignificant. The country assumed in fact a plateau-like character, and consisted of immense table-lands. Three big black yaks, grazing beside a pool, set off in a heavy gallop after us, thinking no doubt that we were somehow old acquaintances. But when they arrived within a couple of hundred yards of us, they perceived their mistake, and swinging round, went off at a clumsy jog-trot. Before us were two smaller lakes; but when we attempted to march between them, we were stopped by the channel which connected them, for it was 6½ feet broad and 5 feet deep. Skirting the more southerly of the two lakes, we became aware of a third lake of great area, farther towards the south-east, backed by low, dome-shaped hills. As there was good grazing on its nearer shore, we stopped there and pitched Camp no. XXX.

The 21st of August was devoted to rest and astronomical observations. The weather was splendid, beautifully warm, and the flies were buzzing about in the sunshine. We pitched our tents a little bit back from the lake shore, on some sandy hills, which absorbed the rain without making the ground soft and muddy. The strip of shore itself was low, and strewn with gravelly débris. The water of the lake was salt and bitter; but, fortunately, we discovered a fresh spring close by. And we had no lack of fuel, for yappkak bushes were very plentiful, and grew larger than usual. Two or three of the men, who came in carrying big armfuls of it, were a good deal disturbed in their minds by an uncanny howling they had heard, and asserted it was men shouting. But Aldat, who had been out hunting, explained that the noise was made by wolves. It was getting high time we did have fresh meat, for we were living almost entirely on rice and bread, although I still had a few

tins of preserved food left, and every day Cherdon made me a good, nourishing soup of green peas, wild garlic, and Liebig's extract. This last I found of immense service during the journey; it was light of weight, went into small space, and possessed relatively great nourishing value.

CHAPTER XXXIII.

ADVENTURES ON A SALT LAKE.

On the 22nd of August I made the following arrangements. Kutchuk was to row me across the big lake, in a diagonal direction, towards a dominating peak which lay 50° east of south. Meanwhile the caravan would march west and south round the lake, until they came to the foot of this same peak. As their road might possibly be stopped by the considerable glacier-stream which we had followed a couple of days ago, and which entered the lake at its south-west corner, I sent on Mollah Shah on horseback to find out. He came back in the evening, and assured us there was no hindrance; but at the same time he reported another lake farther to the west, and equally large, which no doubt received the melting waters of the glacier. I assumed, therefore, that the caravan would have no difficulty in reaching the rendezvous before us, for we should spend a good deal of time in taking soundings and other observations. I ordered Cherdon on arrival to light a big fire, to serve as a beacon for our guidance.

It was a warm, bright day, the lake was like glass, and the turquoise-blue of the sky was only flecked by a few light, fleecy clouds. Whilst the caravan was loading up we got the skiff ready, putting into her the sail, the oars, and the life-belts, as well as the necessary instruments. We got started some time before the caravan, which we subsequently saw skirting the lake in a long string.

The bottom of the lake was covered throughout with a layer of salt, from ¾ to 1½ inches thick quite close to the shore. The salt rested upon red mud, and broke under our naked feet; for we had to drag the boat a good mile before it would float. Even at that distance from the shore the lake was barely 20 inches deep. First we directed our course towards a little

island in the east-south-east, Kutchuk punting, not rowing; and every time the oar touched the bottom, it produced a sound as though it struck against a stone. This extensive lake was nothing more than a gigantic salt-pan, utterly destitute of life—not an aquatic bird, not a lacustrine animal, not an alga. The very shore itself was barren as far as the water washed up it. The grass only began on the sandy hills several feet above the water. On its west side were some peculiar islands of rocky débris, semicircular in form.

The little island we were making for was shaped like a pear, with its stalk pointing towards the north, and its maximum height above the lake did not exceed 16 feet. It was a peaceful fragment of virgin soil, carpeted with excellent grass; but the only indication of organic existence it bore was the skeleton of a bird. Nevertheless, it afforded me a splendid view all round. Both east and west the country was perfectly open right away to the horizon. To the north-west was the massive mountain-knot, covered with glaciers, beside which we had encamped two or three days before. On the south the principal features were low, softly rounded ridges; in the north, the range we had last crossed, overtopped here and there by snowy peaks. The island was encircled by a narrow belt of blue clay; but beyond that was the layer of salt, all the irregularities of its surface being visible through the transparent water. After a while Kutchuk was unable to punt, and had to take to rowing, which of course made our advance somewhat slower.

The soundings of this lake gave a result I did not at all expect. Its floor was almost perfectly level; the maximum depth only slightly exceeded $7\frac{1}{2}$ feet, or one-half the depth of the marsh of Kara-koshun. The difference of depth given by the various soundings did not exceed one inch. Thus the water formed a thin layer upon the top of the salt deposit. I had brought with me a sounding line several hundred fathoms long, but we found our seven-foot oar, which was accurately graduated to scale, quite sufficient for our purpose. Towards the east the lake appeared to extend to an immense distance, but this was only an optical illusion caused by mirage; for the eastern shore came into sight, though not very clearly, late in the afternoon.

It was altogether a remarkable day that I spent on this salt lake. The weather was splendid, the air perfectly still,

Turdu Bai and Kutchuk, with the Skiff Folded up, the Sounding-line and Lifebuoys (from a Photograph taken at Temirlik).

and the few white clouds which hung about the crests of the adjacent mountains were every one reflected on the surface of the lake. The sun, that rare visitant in these unfavourable regions, was very warm; we were delighted to get a glimpse of summer, and dream of its fleeting pleasures. It was delightful, too, to bathe our faces in its hot beams, and feel that we were dry after the many wettings we had had in the Arka-tagh, and at the same time delightful also to escape from the poisonous insects which, in lower regions, were such devoted associates of the summer sun. All around us was the silence of the grave, not a fly buzzing in the air, not a fish leaping in the water, the lake as lifeless as a chemical solution. The restless spirits of the air were taking a holiday, though doubtless only to prepare themselves for fresh outbursts. It was, in fact, as tranquil and peaceful as a Sabbath-day.

Viewed through the pure and rarefied atmosphere, there was something light and evanescent about the landscape. I can only liken it to a bride in an "Empire" robe of white and sky-blue silk; it was the airiest *aquarell* in diluted colours; everything was ethereal, transparent, like a *fata morgana* or a half-remembered dream. The water, except in the immediate vicinity of the skiff, where it was green, reflected the light blue colouring of the sky.

After the slow, dragging pace of the caravan, it was delicious to travel in this way. My place in the fore was as comfortable as an easy chair, and there I made my observations and sketched, precisely as I had done some months before on the big ferry-boat on the Tarim. I had no need to trouble about steering; a glance at the mountain we were making for was sufficient to control our course. Kutchuk sang and hummed as he rowed; or rather he did not row, he paddled. The mast and sail were lashed across the boat amidships, so as to be out of the way. I had brought no overcoat or furs with me; if I turned cold, I could of course take a turn at the other oar. But I was perfectly warm; the temperature of the air was 14°.0 C., or 57°.2 Fahr., while the temperature of the water was 17°.1 C., or 62°.8 Fahr. I revelled in the enjoyment of existence, and forgot all about the showers of hail.

The water was so heavily charged with salt that the drops which fell into the boat stiffened like stearine; after the water evaporated, there was left a thin, chalky-white hollow ball, which generally collapsed. The oar with which we took the

soundings looked as if it had been painted white, our hands got white and rough, our clothes were spotted white from top to toe, from the sprinklings of the spray, and the velocity-instrument glittered all over with crystals. The bulwarks and bottom of the boat looked as if she had been recently employed in transporting flour. For the first few hours we saw the caravan duly marching along the western shore, and after that I saw it from time to time through my glass, plodding along in its usual orderly fashion. It was making a detour, whilst we were going in a straight line towards the rendezvous. Thus at first our routes diverged, until the caravan disappeared behind the hills, and after that I lost sight of it.

Mile after mile the depth remained constantly six feet. Hour after hour Kutchuk paddled steadily on, and yet we seemed to get no nearer to the southern shore. Towards the afternoon light clouds began to gather in the sky, and the bright surface of the lake became as it were marbled over. The lap—lapping of the water against Kutchuk's oar was the only sound that broke the brooding silence of this Tibetan Dead Sea, which lay at an altitude of 15,634 feet above the level of the sea.

At four o'clock the sun peeped out again, and now the lake appeared to extend farthest to the west, this effect being, of course, due to the low angle of the sun's rays as he was setting. I failed to see the caravan; but then the distance was great, and they might be hidden behind the hills. Further on in the afternoon the surface of the lake clouded over along the southern shore, and we heard a rushing noise, which gradually approached nearer. Kutchuk thought it was a stream entering the lake somewhere close at hand; but it soon became evident that it was a tempest rising. The wind blew from the east, and made it hard work to paddle; but it soon grew stronger, and we hoisted the sail and turned to the south-west. Then away we bowled at a glorious pace across the high waves, which, with a hollow roar, lashed themselves into white foam against the gravelly beach. We were afraid the sharp gravel would cut the canvas hull of the boat; but we managed to get the sail down in time. Kutchuk jumped out into the water, and helped her up, whilst I pushed with the oar, and in that way we got her beached without damage.

It was now dusk, and we hurried to the top of the nearest hill to look for the caravan; but not a trace of either man or

animal! The whole region was silent, uninhabited, almost weird in its loneliness. It was like entering the ruins of a monastery in which no man has put foot for a thousand years. Whilst Kutchuk gathered an armful of yappkak fuel —the shrub grew plentifully just there—I penetrated farther up amongst the hills, but was stopped by two or three creeks and lagoons, in which the salt lay like ice, merely covered by a thin film of water. On a hill-side 'was the bleached skull of a kulan, and not very far away we noticed the foot-prints of a bear. I shouted, I listened, I shouted again, but no answer. The caravan was nowhere within hailing distance.

When I got back to our landing-place it was already dark. Kutchuk had gathered together a big pile of fuel, and as I had nothing else to do, I set to work and helped him to make it bigger. It was abundantly clear that some unexpected hindrance had arisen to prevent the caravan from reaching the rendezvous. Otherwise they would at least have sent a mounted messenger or two to tell us where they were, and—what was to us more important still—bring us food and water and warm clothing. Our first idea was to make use of the favourable breeze, and sail on to the west; but second thoughts showed that would be very risky in the darkness, especially as the wind was still increasing in violence. And, after all, the circuit round the lake might be a good deal longer than we anticipated, so that there really had not been time for the caravan to get round.

The best thing, therefore, was to make ourselves as comfortable as we could for the night. Choosing a level space, we stacked up our fuel, lifted all the things out of the boat, and took the boat to pieces; then, raising the two halves on end, we made, as it were, two sentry-boxes, which sheltered us capitally against the wind. Scarcely had we finished our preparations when it began to rain. Then we tilted each half of the boat at an angle of 45°, propping it on an oar, and in this way procured a roof over our heads as well. Converting the life-belts into pillows, we each managed to get a short nap. At nine o'clock I wound up the chronometer, and took a meteorological observation, whilst Kutchuk lighted the fire. Then we sat and chatted for a couple of hours; but it would have been much more enjoyable if we could have had a cup of warm tea and a slice of bread, or even a cup of water. From

this I learned never to embark again without taking food and extra clothing with me.

When we had used up all our fuel, it was time to think of going to bed, and here the two halves of the skiff again came in very handy. We spread the sail on the gravel, though that did not make it very much softer. Then half burying the life-belt in the ground, and doubling myself up, I lay down, while Kutchuk tilted the half-boat over me. After that he stopped up every crevice with gravel and sand, using the oar blade as a spade. The bottom of the boat was only an inch or two above my head, and I was packed into it like a corpse into a coffin —an idea which was a good deal strengthened by Kutchuk's digging and scraping outside. Inside it was as dark as the grave, and the space was so confined, that I had the greatest difficulty in turning myself round.

After spending a whole day on the water, and getting no supper, I naturally felt cold ; but in my cosy " tent " I very soon grew warm. Kutchuk made himself comfortable in a similar way. Capital thing that boat ! First she carried us all day across the lake, then she sheltered us all night on shore, and when, a little afterwards, it began to pour with rain, and the heavy rain-drops rattled like drum-sticks against the taut canvas, we only felt all the more comfortable. We chatted for a little while, Kutchuk's voice sounding through the double canvas walls like a voice from the grave, and my own hollow and sepulchral. But Nature soon asserted her right, and we slept as sound as the dead, oblivious alike of wolves and bears and our own faithless caravan.

I was awakened two or three times by the insidious cold, but at length daylight blinked in under the bulwarks, and I was astonished to find it was already seven o'clock. I called Kutchuk, who came and helped me to open my coffin lid, and, sure enough, there was the sun high above the horizon. We were both stiff with cold, and made haste to gather a fresh supply of fuel, which we lighted with our last two or three matches. The fire put fresh life into us. As there was a fresh and steady east wind, and we neither saw nor heard anything of the caravan, I decided we would go and look for them. We put the boat together again, rigged her up, launched her, manned her, and shook out the sail, using one of the oars as the boom and the other as the rudder, and away we skimmed like a swallow, hugging the southern shore. The wind blew

hard, and the lake rose high, so that the skiff rolled a good deal, and Kutchuk, who sat in the bow, was seasick. I was busy taking soundings, measuring the velocity, and mapping the route. At the end of an hour or a little more, I saw through the glass two white objects at the western end of the lake, surrounded by a number of small black dots. The former I took to be the yurt and the tent, the latter the men and animals of our caravan.

At the end of another three hours we reached our destination. Cherdon and Aldat waded out and hauled us carefully ashore. It was as I supposed: the caravan had been stopped by a broad river, which was too deep for them to ford, and which flowed out of the large lake farther west. Turdu Bai had tried it in several places, but always found the water so deep, that his horse lost his feet and began to swim. After that they turned back and encamped beside the spring where we found them. They had kept a fire burning all night on a hill, to serve as a beacon to us, in case we should be driving about on the lake. As they were in urgent need of fresh meat, Aldat had managed to shoot a kulan or wild ass. During my absence our young wolf-cub was so generously fed that he died from over-eating himself.

Directly we landed, Cherdon brought me coffee and breakfast. The rest of the day I spent in making up arrears of work. The next question was, which way were we to go? If we turned to the west, it would take us three days to get round the new lake; and to the east lay the big salt lake which we had just crossed. On the south we were stopped by the river, which ran from the evidently fresh-water lake into the salt-water one. To turn back was not to be thought of. I would not go back until the miry high ground had frozen sufficiently to bear us. Finally I resolved to convoy the entire caravan across the river with the aid of the skiff.

Whilst I and Kutchuk rowed round to the mouth of the river, which was about 325 yards across, the caravan went down to the spot where it was narrowest. Just outside the mouth we found a ridge or bank, with only about 20 inches of water on it; this would have made a first-rate ford, except that there was a gap in the middle of it 8½ feet deep. At the spot where the animals were being unloaded the water, notwithstanding there was a strong current flowing out of the fresh-water lake, was intensely salt. We saw the two waters blend-

ing together—turning thick, and giving rise to eddies, as when a spoonful of sugar is put into water.

Both banks consisted of hard gravel. The place where the

Towing a Camel Across the River.

Firm Ground under Foot.

crossing was to be made was 190 feet wide. The principal difficulty was getting a rope stretched from one side to the other. Having tied together the greater part of the ropes

The Salt Lake at Camp no. XXXV.—Seen from the North-west.

with which we lashed on the loads, we made one end fast on the left bank and dragged the other end up stream; then, whilst I rowed across as hard as I could pull, Kutchuk stood up in the bow with the end of the rope in his hand ready to jump ashore. But we failed to hit the little headland on the other side; the rope was too short. Back we hauled ourselves, joined on another piece of rope, and repeated the manœuvre again—this time with a better result. Thereupon we made the rope fast on the right bank and tightened it until it hung clear of the water.

We tried to drive the horses across, but they refused to

A Camel which has just Swum Across the River.

enter the river until after we had towed one of them over. But the worst business was with the camels. As it was impossible to get them to swim across themselves, there was nothing for it but to tow them over with the boat one by one. Having forced a camel into the river, we slipped a rope round his neck, with which Turdu Bai, crouching in the stern, supported the animal's head above the surface. Meanwhile I hauled the boat across the river by pulling on the rope. But as the camel did not condescend to exert himself in any way, but simply lay and floated like a log, I had his entire weight to bear as well as the full force of the stream, and was obliged to exert myself to the uttermost; if I had let go, the whole bag of tricks would have drifted out into the lake and the camel been lost.

However, I managed to get him far enough to feel firm ground under his feet, and he then condescended to help himself.

After we had in this way ferried across the third camel, the rope grew so slack that it dipped into the water. Whilst we were doubling it, and tightening it up again, the first rope broke, and so we had to do the whole thing over again. As my hands were by this time badly blistered, Cherdon hauled across the remaining three camels. Our last surviving sheep, which was accustomed to keep beside the camels, swam over of its own accord.

We carried the baggage across in 14 journeys, and encamped on the spot where we landed. This river was the largest I had hitherto seen in Middle or Northern Tibet. It carried a volume of 1,678 cubic feet in the second. In all probability it had its sources a long way to the west, and gathered into its basin all the glacial streams of the region. Several small aquatic animals were carried by the current from the fresh-water lake towards the salt-water lake; but they would of course perish as soon as the infusion of salt grew too strong for them.

As two or three of the horses and one of the camels had chafed backs, we allowed them to travel for the next few days without loads. My favourite grey also needed rest, so I rode another horse. It was my custom to train my saddle-horse to stand when I wanted to take a compass-bearing; and the moment I put my hands into my pocket to get my compass, my good grey used to stand perfectly still until I had finished.

We now climbed the hills, consisting of soft material, without a trace of hard rock, which bordered both lakes on the south. At intervals we found excellent grass on the hill-side, which, added to the springs and the abundance of fuel, tempted us to stay; but the animals were still tolerably fresh, and so we kept on. After crossing a low ridge, we came upon another lake, which, although without visible outlet, was nevertheless fresh.

Amongst the hills south-west of the lake, we observed 18 yaks grazing, and higher up a herd of above a hundred, young and old together—in fact, the ground was black with them. Whilst we were watching them, the sky darkened in the east and west simultaneously, and the rumbling of the thunder—a warning, like the lion's roar, for us to be on the alert—announced that a storm was approaching. Down burst a hail-shower with overpowering violence. The yaks disappeared in the

My Yurt at Camp no. XXXV.—Looking North.

thick downpour, as also did Aldat, with his gun on his shoulder, as he hurried up the slopes on the other side of the valley. Leaving him to look after himself, we continued along the lake-side, and encamped beside a little pool a mile or so from its southern shore. About nine o'clock we heard shouts in the darkness, and two or three of the men, whom I sent out to see what it was, met Aldat utterly wearied out, staggering under the load of a big lump of yak-flesh and a yak's tail. Aldat's victim was a well-grown calf, which had dropped at the first shot.

The next day, being Sunday, was devoted to rest. Aldat and Kutchuk rode back to the place where the former had killed the yak, and fetched in a whole load of meat—an invaluable addition to our scanty larder. Cherdon cut me some cutlets, which were not at all bad; but then it was a young animal, whose flesh was tender.

On the 27th of August we steered due south, and soon crossed a little brook, the water of which had a temperature of no less than 20°.3 C., or 68°.5 Fahr., and contained an extraordinary number of small crustaceans. That evening, too, we encamped on the shore of a large lake, where the grass was too good to be passed; in fact, the hills on its western side were overgrown with what I may describe as luxuriant grass. The water of the lake had a specific gravity of 1.021; but there were springs of fresh water not far away. The next day we skirted the south-west corner of the lake, crossed over a ridge of flattened hills, and were again stopped by a labyrinth of creeks, pools, and other sheets of water. One of these was of considerable size, and had a strong muddy red current. Mollah Shah tried in two or three places to wade across it, but it was too deep, and he was forced to turn back. So, here we were again stopped by an impassable river, and were just on the point of turning up along its northern bank in search of a fordable crossing, when we perceived our old, all too familiar enemy threatening us. Although there was an east wind blowing, the western horizon was darkening rapidly. Masses of cloud, heavy as lead, came rolling across the country, with the sweep of an immense seine-net. Or rather it was like an army advancing both wings at once to the attack with irresistible *élan*. The clouds of the left wing had blood-red edges, but those of the right wing were black as ink. The advanced skirmishers were packed together in the most extraordinary formations, as they raced before the tempest. All this time

the country in the east was basking in bright sunshine ; but the terrible net of the west was drawing in closer and closer around us. We hastily decided to encamp where we were, though not too close to the stream, for the violent downpour might perhaps cause it to overflow its banks. Every man gave a hand with the framework of the yurt, and we had just got two or three felts stretched across the top spars when the storm burst. The hail-shower literally swept along the ground. Every pellet stung, for they came as if discharged from a pea-shooter. There was quite a race for shelter.

The next morning the weather was not very promising, and it was noon before we got the boat ready for measuring the stream and exploring the intricate network of water-ways which stopped us. To the north lay the big salt lake, which I and Kutchuk had sailed across, while to the south was another lake of very respectable dimensions, which, like the fresh-water lake I have mentioned before, discharged itself into our special friend, the salt-water lake. In its lower course the new river expanded into two or three broad basins. Not knowing in which direction the stream flowed, we entered one of these side arms, but were of course soon turned back. At its inner end was a flock of about 50 wild-geese, presumably resting on their way to India for the winter. But at our approach they all flew off, except one, which took to the water. We made for him and pursued him for nearly an hour, his divings growing shorter and shorter, until at last we got within about 12 yards of him, when I began to harpoon him with the oar, the only weapon I had at hand. He was several times embarrassed by the blade, and at length succumbed to a well-directed shot. He made a welcome change in our bill of fare.

We eventually discovered, that the new stream joined the broad river which flowed from the fresh-water lake to the salt-water lake. Landing on the other side of it, we climbed a hill, and perceived we were almost entirely surrounded by large sheets of water. We were standing at the very extremity of a neck of land which ran due east, and had to the north of us the big salt lake so often spoken of, and on the south the fresh-water lake we had just discovered. About half-way down the neck of land was a low range of hills, with apparently plenty of good grazing and abundance of game at its southern foot. On our way back to camp, I made up my mind to have a sail on these new lakes.

The Salt Lake at Camp no. XXXV.– Looking to the North-east.

CHAPTER XXXIV.

A TIBETAN LAKE-LAND.

CAMP no. XXXVI. was now the base for further operations. Leaving Turdu Bai, Aldat, and Niaz there with the camels and four tired horses, I, with Cherdon, Mollah Shah, and Kutchuk, besides seven horses, our one mule, and the dogs, went off on the new excursion. We were provisioned for a week, and took with us only such things as we absolutely needed, in addition to felts and furs. The boat, of course, was indispensable in this land of lakes. I packed my instruments in the big camera case. Of the yurt we only took one-half—that is to say, the lower part of the framework, and a couple of felt rugs to cover it. The men made a shelter in bad weather out of a few of the roof-spars and two or three felts. After the horses had waded across the river, getting only the lower half of their pack-saddles wet, we easily carried our loose luggage across in the boat.

Before we advanced very far we were stopped by the sound that connected the two lakes, and had to unload, swim the horses across, and ferry over the baggage in the boat. As soon as we were once more loaded up, we got started in real earnest, skirting the northern shore of the fresh-water lake. Very soon, however, we came to a place where the hills plunged steeply down into the water—nay, actually hung over it—so that we were forced to climb right over the top of them. Extensive sheets of water stretched both right and left of us.

We put up our temporary yurt beside a little brook that issued from a side glen, about 300 paces up which a herd of big black yaks were peacefully grazing. As they made not the slightest attempt to flee, I was inclined to think they were tame yaks, and must belong to a band of nomads somewhere in the neighbourhood. But when we turned our horses loose to graze, and they slowly made their way up to the richer grass where the yaks were, the latter sniffed and turned and steadily examined us, and then

went off at a gentle trot over the crest of the hills towards the salt lake.

My quarters were so confined that Cherdon had to make the bed first, and then fix the lattice framework round it. It was like creeping into a dog-kennel; but once inside, I was very comfortable and warm, especially after I let Yolldash come in beside me.

Although during the night the thermometer fell to $-5°.2$ C., or $22°.6$ Fahr., the next day, the last of August, turned out a splendid summer's day, without a speck of cloud or a breath of wind. The lake was as smooth as a duck-pond. A kulan came and had a look at the horses with as little concern as if he knew perfectly well that Cherdon's cartridges were all exhausted long ago. On the southern side of the lake were two peaks, crowned with glittering white snow, which, with the flawless sky above them, were reflected with photographic distinctness in the lake. A few hours' further march took us to the end of this lake, but a new neck of land, only a few hundred yards broad, separated it from yet another lake, which extended still farther to the east. This also we followed along the northern shore.

For a short distance we travelled on the top of the cliffs, which hung some 230 feet above the surface of the lake, following a kulan path, which ran so near the edge as not to be altogether pleasant. Away below in the water we could see a shoal of very large black-backed fish, which greatly excited Kutchuk's interest. So we stopped, to see if we could not catch some. We made hooks out of the metal in Yolldash's collar by heating it in the fire and hammering it out. At the same time we contrived a bow out of the ribs of our tent; if we came across wild-duck we might perhaps hit them with arrows. You see, we were living like Robinson Crusoe, and had to do the best we could with such scanty materials as we possessed.

The evening was raw and windy, and the prospects for the morrow not very promising. My yurt stood as firm as a rock, but the interior was so confined that to dress and undress was attended with a certain amount of difficulty. Early the next morning I walked to the top of the nearest hill, and thence obtained a splendid view of the entire vicinity, in which water was decidedly more abundant than land. The lake, which sent off a wedge-shaped arm towards the north-east, lay spread out below my feet like a map. It was situated at an altitude of 15,906 feet above the sea. We had thus come down to a relatively lower level, but

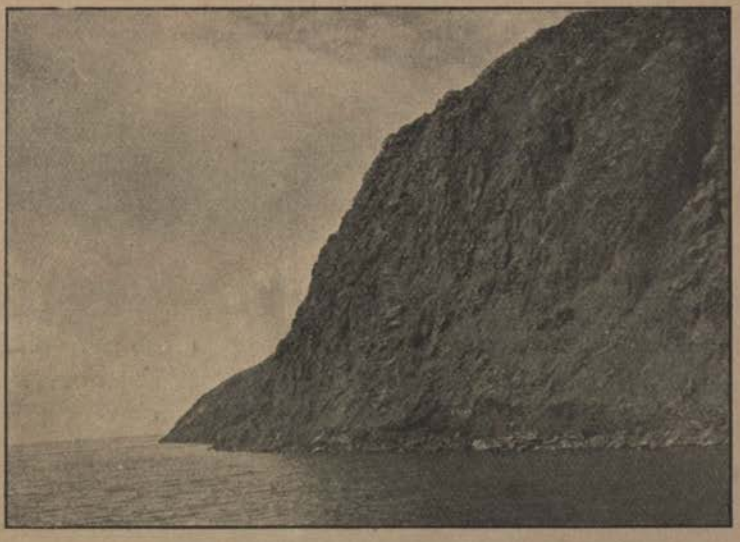
were still higher than—the top of Mont Blanc! In the meantime Kutchuk had launched the boat and got her ready, and as soon as I returned we rowed in under the perpendicular cliffs of red sandstone where we had seen the fish.

Meanwhile the caravan continued its way round the lake, having instructions to stop on the south side, immediately underneath a peak, which I have indicated on my map by the sign Or. We anchored the boat quite close to the shore, with big segments of the mountain wall hanging over our heads, as it were, by a hair, and threatening every instant to topple down and crush us. Although we felt nothing of the north-west wind, because we were in shelter, we nevertheless heard it swishing along the crest of the precipice.

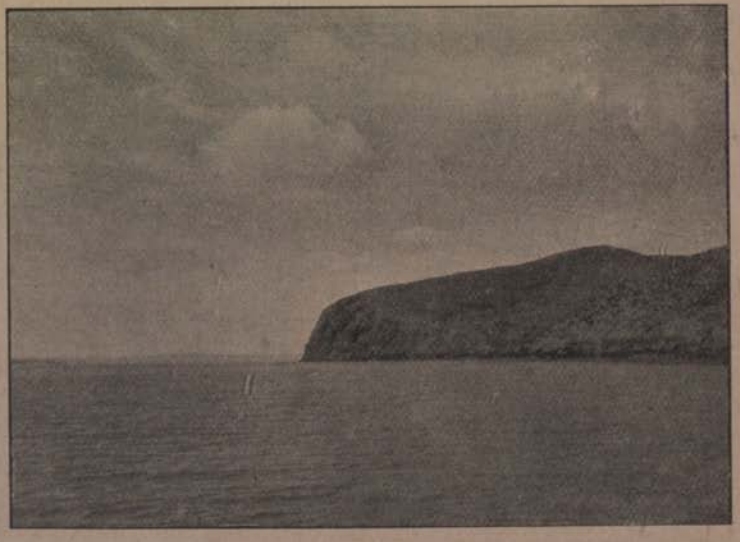
For a fishing-rod we used one of the spars of the boat, our bait consisting of small pieces of yak flesh, while an empty match-box served capitally as a float. The *asmans*—the fish—bit splendidly, yet we only caught four medium-sized fellows. We were not fishing for amusement, but because we wanted food, and our catch was barely sufficient for one meal. However, skimpy though that meal was, it was a great change, and the fish was tasty.

But whilst I sat in the boat thinking and enjoying the sunshine and the rest, the hours flew all too fast, and it became time to start for the rendezvous. But it was darkening in the west; the sky was rapidly clouding—a storm was brewing. We had to choose between staying where we were until it was over—which would hardly have been worth while, for it was now two o'clock, and the caravan no doubt by this already arrived at its destination—or we might take the risk of crossing the lake. I preferred the latter course. Before Kutchuk had rowed very far we began to feel the north-west wind, which helped us along first-rate. Right ahead the leaden, grey clouds were trailing long fringes of hail across the mountains, gradually blotting them out. Behind us the sky was thickening in the same way. The storm approached nearer, the lake went higher, its waves hissing white-crested around us. Down came the hail-burst, peppering the water with its big round pellets. In a moment or two the inside of the boat was as white as chalk. Water and hail, water and hail—everywhere! Shores and mountains alike vanished! We had to keep a sharp watch upon the water, for, as the wind went on increasing in violence, the waves broke higher and higher. Still, as they were several times longer than the

boat, we had only to keep her head straight before the wind, and we rode on beautifully, up and down, up and down, with the spray dashing from our bow. Immediately south of the red



The Fish Mountain.



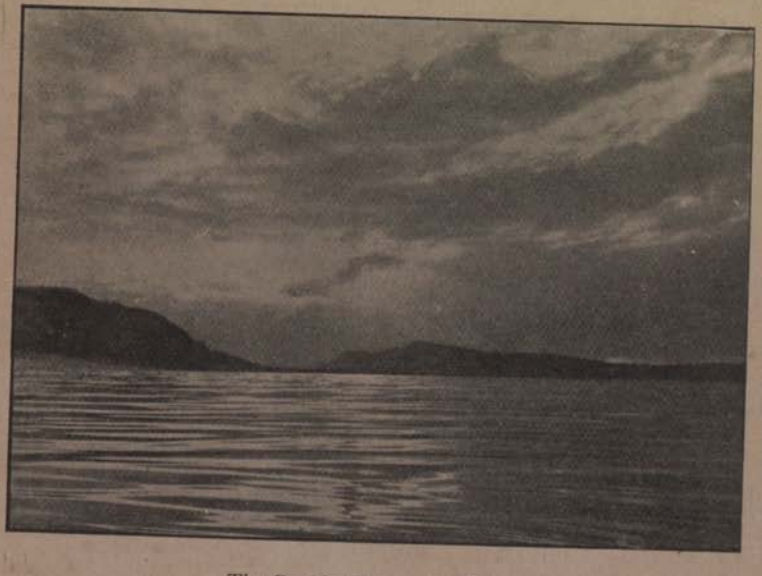
The Fish Mountain Seen from the Middle of the Lake.

sandstone cliffs the sounding-line had given a depth of 159¾ feet, the greatest depth I ever sounded in Tibet, but this rapidly decreased as we approached the southern side, until I began to

fear the lake would shallow to such an extent that our light craft would be dashed like a nutshell against the beach.

The hail ceased, but not so the wind. It, on the contrary,

View Down the Lake—The Storm Disappearing in the Distance.



The Sun Setting on the Lake.

raged still more fiercely, for the further we proceeded from the cliffs the more we became exposed to its fury. Still there was one thing in our favour: we were now at any rate able to see

where we were going to, and found we were not yet half-way across. We now steered for a headland, behind which we hoped to obtain some shelter. The waves meanwhile rose so high that they hid the shore from us when we went down into the trough of the "sea," and when the sun peeped out through the clouds, as he soon did, they were almost weird-looking: they glittered like the backs of dolphins, changed from blue to green and from green to blue, and were capped with hissing foam, which sparkled like jewels where the sun's rays tipped them. The canvas covering of the skiff was indented every time she pitched, and was strained so tight that a single powerful side-blow would have been sufficient to burst it; hence we had to manœuvre her with both oars so as to shield her against the onset of the waves. To be brief, this voyage again ended happily. The storm passed over, the wind subsided, the features of the shore came out distinctly, and we altered our course, making straight for the camp. The sunset was magnificent. The sun himself was hidden behind a dense black cloud, but his reflected rays glittered like quicksilver as they streamed across the ruffled surface of the lake.

We were now a long way from our base-camp under Turdu Bai's charge, and it was time to think of returning to it. According to my reckoning we could not be very far from the sources of the Yang-tse-kiang, and I had not given up all idea of trying to discover them. But one thing was clear; the three large lakes which we had discovered in this region had plainly nothing whatever to do with the Yang-tse-kiang, but formed a self-contained basin, possessing no outlet; but as I was not yet absolutely sure of this, I resolved to sacrifice the 2nd of September to a ride farther south. This led us over undulating tablelands, with scanty grass and dangerous, yielding ground. After going 16¾ miles, we stopped on the bank of a stream, which entered the next lake—a small salt pool lying south-east of the preceding. Beyond this we were unable to proceed, because of our fast diminishing supplies and our exhausted horses. Next day we turned back, but struck off to the west. We again very nearly got stuck fast in the treacherous quagmires, the horses sinking in nearly two feet. A large stream, which issued from the mountains on our left, flowed due north, and emptied itself into the lake in which we had fished. We travelled along its bed, for it was there we got the firmest ground to ride upon.

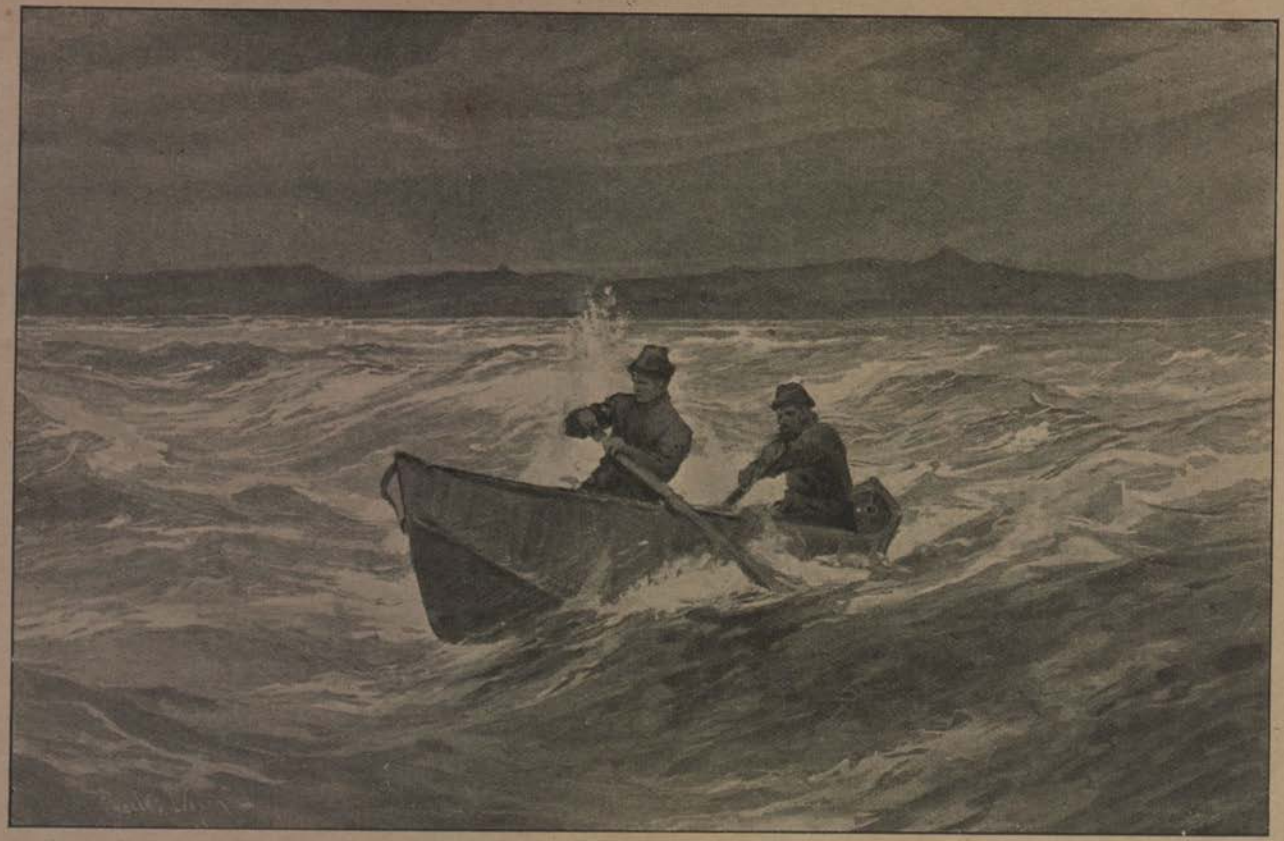
Game was extraordinarily plentiful thereabouts. We saw fully half-a-dozen herds of orongo antelopes (*Pantholops Hodgsoni*),

each consisting of a score of individuals, though the yaks and kulans occurred either singly or in small troops. Rats, marmots, and hares were very common, while wild geese and gulls made the lake shores noisy with their screeching. We rode in two divisions, with a gap of about 50 paces between us. Yolldash was very busy amongst the game. Once he drove three kulans at full gallop through the gap between us, but before I could get my small camera ready to snap them, they were gone. About an hour later he went off after a herd of orongo antelopes, and when he came back was covered with blood; he had evidently had a royal time of it. Wolves and foxes frequented the uplands to the south. During the latter half of the day's march heavy snow drove straight in our faces, so that I could barely see the horse which marched immediately in front of me. We were all sheathed in white armour of soppy melting snow, which kept peeling off in big strips. Mollah Shah led the way, following a yak-track, which, fortunately, in spite of the snow, was pretty easy to see.

I had intended next day to row across the lake from south to north, so as to take a second series of soundings, but when we woke the weather was, to say the least, peculiar. The sky was perfectly clear, the sun shone in all its splendour, but a strong half-gale was blowing from the north, and the waves broke noisily on the flat shelving beach. Of course, crossing it by boat was out of the question. We rode west along the shore, which was nothing but a mud bath, a very slough of despond! What a wonderful—what an utterly God-forsaken region this was! The ground seemed to be as thin as the air; the very mountains themselves as soft as pumice-stone. Everything was in a state of disintegration. The weather the most unreliable it is possible to conceive. To embark on the lake was to put your life in direct jeopardy. In some places, although the ground did bear, it nevertheless quaked under the horses' feet, and undulated before them as though it were an indiarubber sheet.

At length we reached the end of the lake, and found that it, too, emptied itself through a broad, and considerable stream, into the lower fresh-water lake. The latter was black with wild geese, trying their wings after moulting, flying round in short, quick circles, in preparation for their long journey to warmer climes. They were being closely watched by a solitary golden eagle. We pitched camp (no. XLII.) beside the embouchure of the river into the lower lake. From this spot it could not be more

than a day's journey to the place where we had left Turdu Bai. Whilst Mollah Shah and Cherdon led the horses along the southern shore of this the lower fresh-water lake, I and my trusty boatman, Kutchuk, started to cross it diagonally. When we started it was glorious weather, with a favourable wind, but we had not got very far when the wind freshened, and drove us out into the open, where, however, the depth nowhere exceeded 10 feet. After about an hour the wind changed, and the usual forerunner of a tempest, the black clouds, loomed up in the west. They divided themselves into two sections, one of which went off over the mountains to the south, leaving a trail of white snow behind it, while the other hastened across the lake to meet us, once more churning up the never-resting waves. The most prudent course would have been to run before the storm, except that we should then have been carried away from our men, who were cut off by the broad channel which connected the second fresh-water lake with the first salt-water lake. We therefore resolved to try and row against both wind and waves. In the distance, to the west-north-west, stood the little hill from which I first saw this lake. Our boat was already pitching in such an uncomfortable manner that I, who was sitting in the fore part, was drenched by every billow that broke. A pelting rain came on and helped to make the situation more disagreeable still. Although we each strained at our oars we made no headway. Very often one-half of the boat would hang over on the top of a wave; then down she would plump, threatening a rent in her fragile covering. Soon another ill-omened change took place in the wind, for it swung round to the south, and blew with unparalleled violence, setting up a second system of waves, which ran at right angles to the first. This caused them at the points of intersection to rise to double their former height. All our efforts were now required to avoid these watery pyramids, and to keep to the relatively level spaces between them; but before we were aware of it, the skiff was hovering on the summit of a wave, and had we failed to balance her there, over she would have gone. Of course, I had now abandoned all idea of taking soundings. We might esteem ourselves lucky if we escaped with our lives, and we kept wondering whether it was to be the next wave or the one after it which was to bowl us over. In this way we toiled for an hour and a half before the storm subsided. But even then the sky wore a threatening aspect, being streaked in every direction by storm centres resembling waterspouts, with



A Struggle for Life.

hanging draperies of black cloud. Most of them went past us on one side or the other; but some of them drifted right across our lake. We were not a bit nearer land when the second storm came and shook out its heavy load of snow and hail over our heads. Although it drove straight in our faces, we could do nothing to ward it off, for one moment's unwariness and over we should have gone. Throughout the whole of that day we toiled like galley-slaves.

During the respite which followed the second squall we made haste to win headway, for the sky was already darkening for the third time; and down charged the third storm upon us with its pouring torrents of rain. The second had painted the inside of the boat white with snow and hail; this half filled her with water, which lapped backwards and forwards as we rode up and down the heaving waves. But this squall, too, passed, and pursued its solitary way across the inhospitable mountains and impressionable lakes which stretched to the east.

After eight hours' hard work we at length came to land, and I was never more delighted to put foot on *terra firma*. Climbing a little hill, I perceived Mollah Shah waiting for us on a headland with the four horses. We paddled round to where he was, and then stopped to take the volume of the stream which we had crossed a week before. We also measured its breadth and sounded its depth, and took three measurements of its velocity, when down came the fourth squall. Although the sun was still above the horizon, it was as dark as midnight, except when the dazzling flashes of lightning lit up the weird chaos of lake and barren mountain. The hail came down from the sky and swept along close to the surface of the earth; the spray rose from the lake and mingled with it. We happened to be just then on the east side of the channel, and it was only by the most desperate efforts that we were able to push our boat over to the other side, although it was not more than 200 feet across. This, however, was the farewell greeting of that day of storms, and I need not say we had had enough of it. We unscrewed the boat, packed sail, mast, oars, and life-belts into the one half, loaded up, distributed the instruments amongst us, mounted, and set off at a smart trot for home.

It was a pleasant change to ride after the long stretch of strenuous rowing. The moon shone through the breaking clouds, mingling her light in a fantastic manner with the

incessant flashes of lightning, which seemed to turn her white crescent yellow every time they flamed out upon it. At length we reached camp, and found all well. Aldat had shot four orongo antelopes, so that we were well provisioned for two or three weeks to come. The camels and ailing horses had gathered flesh during their rest. Even after we lay down to sleep, utterly tired out, the storms still continued to chase one another unweariedly over the earth. We rested all the next day, the 6th of September. The afternoon was like a winter's day, without a single glint of sunshine, while one hailstorm followed another without intermission. Whilst Cherdon and Kutchuk went fishing, the other men prepared the skeleton of an orongo antelope, and I was kept busy recording the results of our recent excursion.

Possibly I often dwell upon events, and describe incidents, which may seem to the reader trivial and insignificant, but I do it for the purpose of conveying some idea of the life which the solitary traveller leads in those desolate, uninhabited wastes. Taken as a whole, they will give a consistent picture of how the days passed month after month in our little community. We were not a large company, and we lived under monotonous conditions, the same occupations recurring with uniform regularity, and our lives strictly governed by the clock. It was only the country we travelled through which, with its never-ending variety and change, kept our interest awake.

With regard to my choice of servants, I had every reason to be satisfied. With stoic serenity Turdu Bai tended the camels as if they were his own children. Cherdon was attentive, alert, and punctual, and yet at the same time a comical little man, with his own peculiar philosophy of life. Mollah Shah watched over the horses with irreproachable care, but was somewhat taciturn, abrupt, and reserved. When on the march, one-half of the horse-caravan was led by Kutchuk, a young giant of two or three and twenty, always happy and contented, but especially so when he was afloat, for most of his days since he was a child had been spent on the water. Without Aldat our situation would have been very critical indeed; he kept us supplied with fresh meat, and was always after the game. But both in camp and whilst on the march he preferred to be left to himself, and spoke but little. Niaz did all the heavier work, carried water, gathered fuel, drove in the animals of a morning, and gave a hand with loading them up. The dogs had the best

time of it, for they had plenty of meat to eat, nothing whatever to do, except to keep watch, and that was a sinecure. And they had a playmate in our last surviving sheep, which nobody had the heart to kill. The creature consorted faithfully with the camels, grazed with them during the day, and at night found a warm and cosy lair beside them.

CHAPTER XXXV.

THE LAST DAYS OF ALDAT THE AFGHAN.

CAMP no. XLIII. was the turning-point of the expedition. Our supplies would not allow us to proceed farther south. We were only provisioned for two and a half months, and we had already spent six weeks on the tramp. Although we still had a plentiful supply of rice, we were obliged to husband our flour with the utmost care, having used too much of it in attempting to save the camel that died. Winter would soon be here, and we ought to return, making a wide detour, first west, then north, then east, back to our headquarters camp in the Chimen valley.

But before leaving this part of Tibet, I wished to cross a particular east-west range, which culminated in the south-west in a vast mountain-mass, capped with perpetual snow. After a rather short day's march to Camp no. XLIV. (16,038 feet), I decided to divide our party, sending on the larger portion of the caravan, under command of Turdu Bai, down a latitudinal valley which opened out to the west-south-west. I ordered him to wait for us somewhere in the open country to the north-west of the culminating mountain-mass, while I myself skirted its left flank. This excursion would, I estimated, take only four days, and I selected Cherdon and Aldat to accompany me. We had only six horses, and carried the small temporary yurt, provisions for a week, and fuel enough to last two days. There *was* a certain element of adventure in the plan, for the Mussulmans might lose their way. But in case our trail should be obliterated by hail or snow, I instructed Turdu Bai to wait for us one week, and if at the end of that time he failed to hear anything of us, he was to abandon all further search, and make his way back as best he could to our head-quarters camp in the Chimen valley. Their provisions could be

made to hold out at a pinch; and as for ourselves, we relied upon Aldat to keep us supplied with meat.

Both sections started simultaneously on the 8th of September, and after leaving the upper course of the river, which some days before had stopped our southward march, our routes diverged, and we were soon hidden from one another by a cluster of low hills. Our own course was towards the south-south-west, through fairly open country, except that it was a little diversified on both the right and the left. The contours rose slowly as we advanced, and the ground became barren, except for a few patches of moss. After riding smartly for several hours we reached a chain of flat hills, with small basins of crystal spring-water between them. Each of these last was surrounded by a belt of short, thick, vivid-green grass, soft as an Oriental carpet. Here, as there did not appear to be any grazing towards the south, while there was good spring water, as well as plenty of fuel, for the district was much frequented by yaks and kulans, we halted for the night, our camp being 16,316 feet above sea-level. Apart from a couple of big wolves, the only traces of animal life were two or three ravens. The weather was, of course, unfavourable; this made the eighteenth day that we had hail-storms and snowstorms from the west. But the night was as usual bright and still, with a clear moon, and as early as nine o'clock in the evening the thermometer dropped to — 2°.0 C., or 28.°4 Fahr.

On the 9th we continued in very nearly the same direction, the surface being a good deal more broken; we were now approaching higher regions. Before we turned due west we were forced out of our way by a watercourse, which issued out of the flank of the big snowy mass in front of us, and which was filled with soft ooze. We were all drowsy and stiff with cold when we stopped at a patch of grass. As soon as the camp was pitched Aldat came and begged permission to stalk a big yak which he had seen grazing not very far away. I went out and watched him, creeping like a cat along the hollows towards his unsuspecting prey. Thanks to the strong wind that was blowing against him, he was enabled to get within thirty paces of the yak. He fixed his gun on its fork, and fired. The yak jumped, making the earth fly all around him. Then he ran a few yards, stopped, staggered, tried to keep his balance, but finally fell. Then he rose again, and went through the same series of movements. This he repeated several times; but at last tumbled

down all of a heap and lay without moving. All this time Aldat lay behind his gun, motionless as a statue, lest he should draw the attention of the dying animal to himself. Cherdon and I now joined him. It was difficult walking; we could only take two or three steps at a time, and then had to stop, for the least effort in this extraordinarily rarefied air brought on quickened action of the heart. The yak was a bull of fifteen years. Out came the knives, his head was cut off, his entrails taken out, and then we left him till the following morning. His fat was the part about him which we desired most. It cost Aldat a real pang to leave behind the magnificent skin, which would have brought him in a good sum at Cherchen; but we could not carry it with us, as we had only three baggage horses. However, I promised to give him full value for his masterly shot.

The 10th of September was a hard day. Before the sun rose, Aldat drove in the horses, which had wandered a long way down the valley, and then went to fetch the head and fat of the yak. That morning our bitterest enemy, the west wind, overslept himself, and did not get up until nine o'clock; but afterwards he took his full revenge for the delay. Our camp was in a bad situation at an altitude of 16,874 feet, and fully exposed to the wind, which blew as it had seldom blown before. We now perceived immediately in front of us the pass on the south flank of the snowy mass which we had to cross over. We trembled as we thought of it; it was so high, and yet it looked innocent enough!

As Aldat did not turn up, I sent Cherdon to look for him; but it was eleven o'clock before they came back. Cherdon found the young hunter lying beside his victim, ill and unable to continue his work. The Cossack helped his comrade down to camp, and also brought some of the yak fat. And, in truth, poor Aldat looked in a very bad way: he was bleeding at the nose and had a violent headache; so I made him sit still, while Cherdon and I took down the tent and loaded up the animals.

The ground was hard; there had been nearly eleven degrees of frost, although at one period of the night the thermometer dropped as low as — 10°.7 C., or 12°.7 Fahr. This was clearly an indication that winter was at hand. Aldat was so unwell that he was unable to get into his saddle without help. On our way up towards the detestable pass which we were about to cross we had on our right, one after the other in succession, the snowy peaks which we had seen at a distance, though now of course they were close beside us; while on our left was a black moun-

tain-ridge, overtopped farther south by yet another snowy mass. As soon as the sun gathered power, the ground thawed, and then began our struggle with the mire. Hour after hour we plodded on up the acclivities, flattering ourselves time after time that we were now quite close to the pass, but time after time we were deceived. We crossed one saddle after another, but always found there loomed yet another ridge in front of us, hitherto unseen.

The horses sank in up to the fetlocks, and the fragments of slate which were embedded in the soft ground caused the poor animals to slip and cut their legs against the sharp edges. There were blocks of stone fully a cubic yard in dimensions, and two or three were as large as cottages. Under the shelter of one of these last we stopped for a quarter of an hour or so to thaw our stiffened limbs. About fifty yards or so north of our track hung two small transverse arms of the glacier, and along them two yaks were travelling at about the same pace we did. Yolldash went after them, and barked himself hoarse, but they paid not the slightest attention to him, though they stopped and regarded us. But, finally making up their minds that we were harmless, they turned and climbed a precipitous moraine, with an enviable ease and agility, which, considering their size and weight, the yielding nature of the foothold, and the intensely rarefied air, impressed me greatly. On the top of the pass the aneroids showed an altitude of 17,803 feet, or precisely half the thickness of the atmospheric envelope which surrounds the earth.

During the day the thermometer never rose half a degree above freezing-point; but the wind searched us to the very marrow—skin vests and furs were no use at all against it. Had we been able to walk, we could easily have kept ourselves warm; but we could not walk—we could only stick to our staggering horses and long for a tolerable spot to camp in. The sole consolation we had was that, having now at length reached the summit of the pass, we should next go *down*. The glen by which we descended led to the south-west, and was filled with débris, through which trickled a little rivulet. A short distance beyond its exit from the mountain we encamped at 17,268 feet above sea-level, or nearly 1,500 feet higher than the top of Mont Blanc! We had only a handful of fuel left, while the animals were forced to be content with the few blades of miserable grass which grew there. Aldat was now unable to stand. We left him lying where he reeled off his horse, after wrapping him up well

with felt rugs. We could not persuade him to take anything; he refused to drink even a cup of warm tea, but lay moaning all night. As early as nine o'clock the temperature was at $-3°.6$ C., or $25°.5$ Fahr., and during the night it dropped to $-11°.9$ C., or $10°.6$ Fahr.

Next morning we crossed the hills towards the north-west. A long way off in the south-west there was yet another snowy mass, the south-eastern continuation of which took the form of a line of snowy pinnacles; beyond a shadow of doubt, it was the range of Tang-la. However, we soon came to a main valley extending east and west, which gathered into itself all the streams, brooks, and rivulets of the region. In order to avoid the necessity of crossing all these watercourses, we decided to travel along the bottom of the valley. But on a small detached hill at the foot of the mountain Cherdon's sharp eyes discovered some small black objects, which he took to be either human beings or yaks. We stopped and regarded them through the glass. They were alive that was certain, for they moved. But one of the objects seemed disproportionately big; perhaps after all it was only a yak cow with a couple of calves.

Encouraged by this, we made direct for the hill where we perceived the mysterious objects. Poor Aldat was now so bad that we had to lash him on his horse to prevent him from falling off. He talked incoherently; his mind was beginning to wander, and he kept begging us unceasingly to leave him behind. After advancing some way down the mountain-side, we made out that the mysterious objects on the hill were two men collecting stones and piling them up into a pyramid, or cairn. An hour later our doubts were cleared up. They were our friends, Turdu Bai and Kutchuk, who had climbed to the top of the hill to look for us. Finding no traces of us they were on the point of returning to camp, but before they did so resolved to build up a conspicuous landmark. The cairn, which was over six and a half feet high, and occupies a conspicuous position, will easily be recognised by any future exploring party.

After giving ourselves a much-needed day's rest at Camp no. XLVIII. (16,645 feet), we resumed our westward journey on the 13th of September. It was repugnant to me to travel when one of our number was sick; but our scanty supplies would not allow us to linger. Aldat's mind had wandered all night; and he moaned, shouted, and sang songs in Persian. The treatment I adopted had produced no effect; he had no longer any command over either body or mind, and sat as limp as a rag,

his eyes fixed in a distorted stare. We carried him on an improvised litter fixed between two sacks on the back of a camel, giving him a cushion for his head, and covering him well with felt rugs, and lashing him on to prevent him from falling off.

After crossing over a low saddle or threshold (16,756 feet) of the valley, we travelled along the sandy bed of the stream, a welcome change to the animals after miry ooze. Cherdon caught sight of a herd of twenty *arkharis*, or wild sheep; but when he tried to stalk them with Aldat's musket, they disappeared like a puff of smoke. The valley we were following led out upon a tableland of soft red sand, overgrown with grass, and open

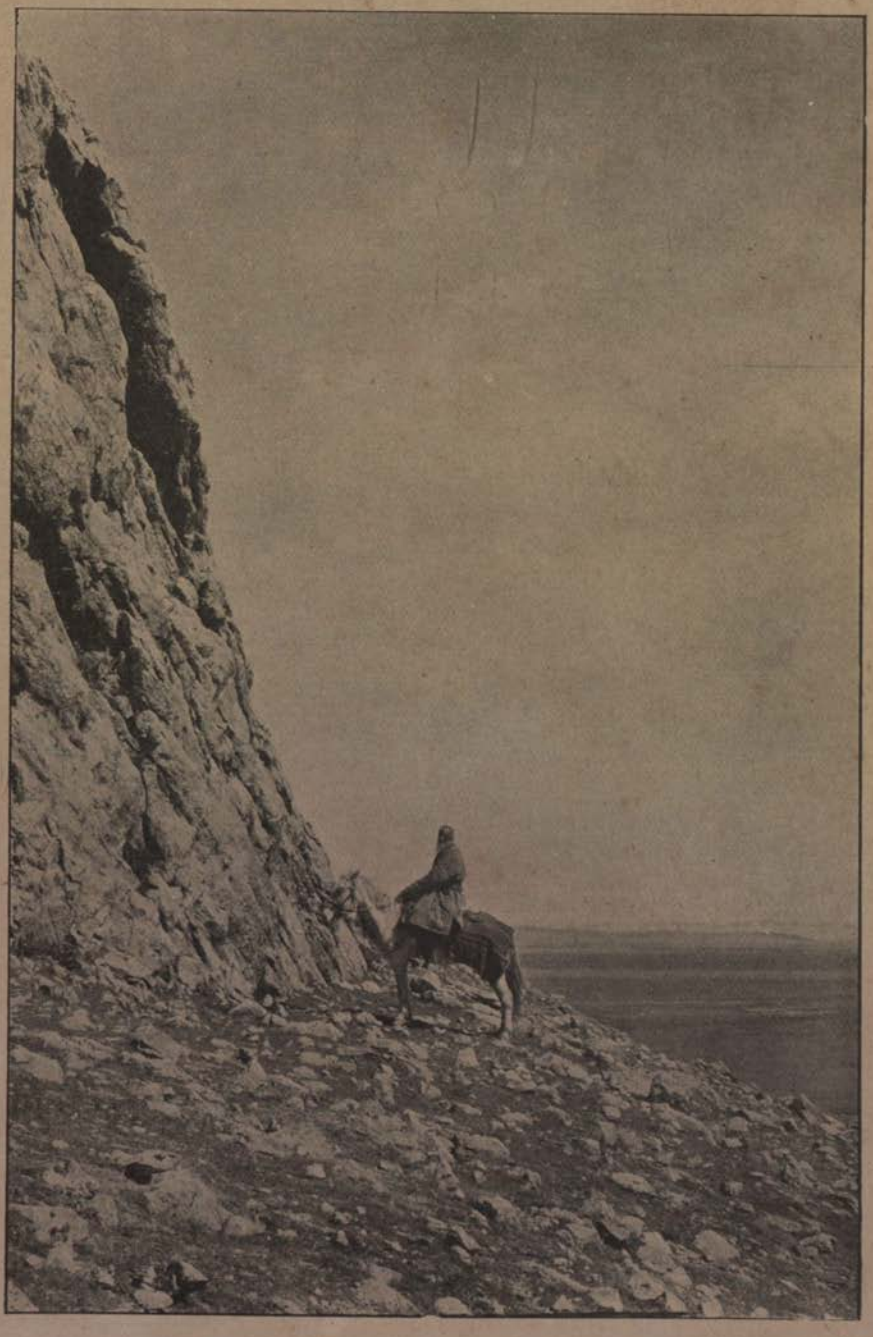
Making a Sick-bed for Aldat.

towards the north-west. Here we encamped beside the first fresh-water pool we came to, at an altitude of 16,087 feet. From this time onwards I had my yurt heated both morning and evening; that is to say, one of the men brought in some glowing embers on a bed of ashes, carrying them on the lid of our cooking-pot, or when that was in use, in my hand-basin. Artificial heat of some kind was certainly needed in the incessant winds which cut across those ugly highlands.

Thanks to a favourable country, almost level and with firm ground, we were able on the 14th of September to travel eighteen and a half miles. The characteristic feature of the landscape was a countless number of small pools, each the centre of a self-

contained drainage basin, with no outlet, and very often without any visible contributaries. After a long search for fresh water, we stopped beside a small spring, surrounded by sparse thin grass. In the early part of the day the weather was splendid; but in the afternoon we were visited by the usual storms of hail and lightning, though now, by way of a change, they came, not from the west, but from the east. Just as we were pitching our tents (altitude, 16,044 feet) it began to snow, and come down it did with a vengeance, much heavier than we had ever seen it before, so that the grass was very quickly hidden. Then the wind veered round to the north-east, and quickened to a velocity of twenty miles an hour. The snow was wreathed up to a great height on the windward side of my yurt. At nine o'clock it was no easy task to take the usual meteorological observations, for not only was it pitch dark, but the snow whirled and blustered so tempestuously that it was quite impossible to see an inch before our faces. Unfortunately my lantern was *hors de combat:* three of its panes were broken and the glass replaced by pasteboard, while the fourth was cracked in a dozen directions, and only held together by strips of paper and gum. The snow crunched under our feet, and after being but a few minutes in the open air, we might easily have been mistaken for snow men, such as children make. The men's tent was only two or three yards from mine, but I literally could not see it, because of the driving snow, and I only knew where it stood by hearing the wind whipping and lashing its cords. Truly a strange experience to be snowed up in a region where there existed nothing but water. Nor were the prospects for the future any brighter; for the melting of all this snow would make the ground like a quagmire. At nine o'clock the thermometer went down to — 2°.1 C. or 28°.2 Fahr., though at one p.m. it had stood at 11° C., or 51°.8 Fahr. But we were now so deeply buried in snow that the inside of both the tent and the yurt were kept warm all night. Outside, the storm howled dismally, and the fine snow pattered, pattered against the frozen felts as if it never meant to stop.

Our spirits were still further depressed by poor Aldat's condition. He was attacked by a serious illness which I confess I did not understand. He complained of pains in the heart and head, and his feet turned black, and were as cold and hard as ice. I rubbed them for some time, hoping to restore the circulation, but it was without effect. They were as if dead, and he had quite lost all feeling in them, even when I pricked them



Turdu Bai Beside a Mountain at Camp no. LIV.

with a pin. This moribund condition gradually crept up his legs; although late that evening I gave him a hot foot-bath, which seemed to do him good. But what surprised us most was the way his mind wandered. Whilst on the march he chattered incessantly, and kept shouting to his camel to lie down, and for a good hour after he was comfortably tucked up in bed inside the tent he kept on beseeching the other men in the most moving tones to let his camel stop. Mollah Shah, who had known him in Cherchen, told us that he had once been out of his mind, but had been cured by a certain Abdurrahman Khoja, an *ishan*, or "holy man," who went to his father's house and repeated certain prayers over him, making him at the same time swallow slips of paper written all over with texts from the Koran. It was heartrending to hear this young fellow of four-and-twenty, who had so recently been in the full strength of manhood, rambling in the delirium of fever, and talking of his old father and his brothers in Cherchen. We kept watch beside his bed all night, and did all we could to help him; but the prospects were anything but favourable for a dying man, to be thus carried on the back of a camel through icy snowstorms, and over mountains which almost scraped the sky.

The horses, impelled by hunger, wandered astray during the night in search of grass; and it was late in the morning before we managed to find them again. The snow lay nearly a foot thick, and owing to its dazzling whiteness was painful to the eyes. Although the sun was warm, the day remained cold and raw, for a cutting westerly wind swept across the snow-fields. Once, when it stopped for a breathing space, the sun actually burnt, but within a few minutes we were once more being buffeted by the blinding snow. This soon passed over, and the sun once more peeped out; but the wind still continued chilly. It was winter and summer in fraternal alliance—in a word, thoroughly typical Tibetan weather!

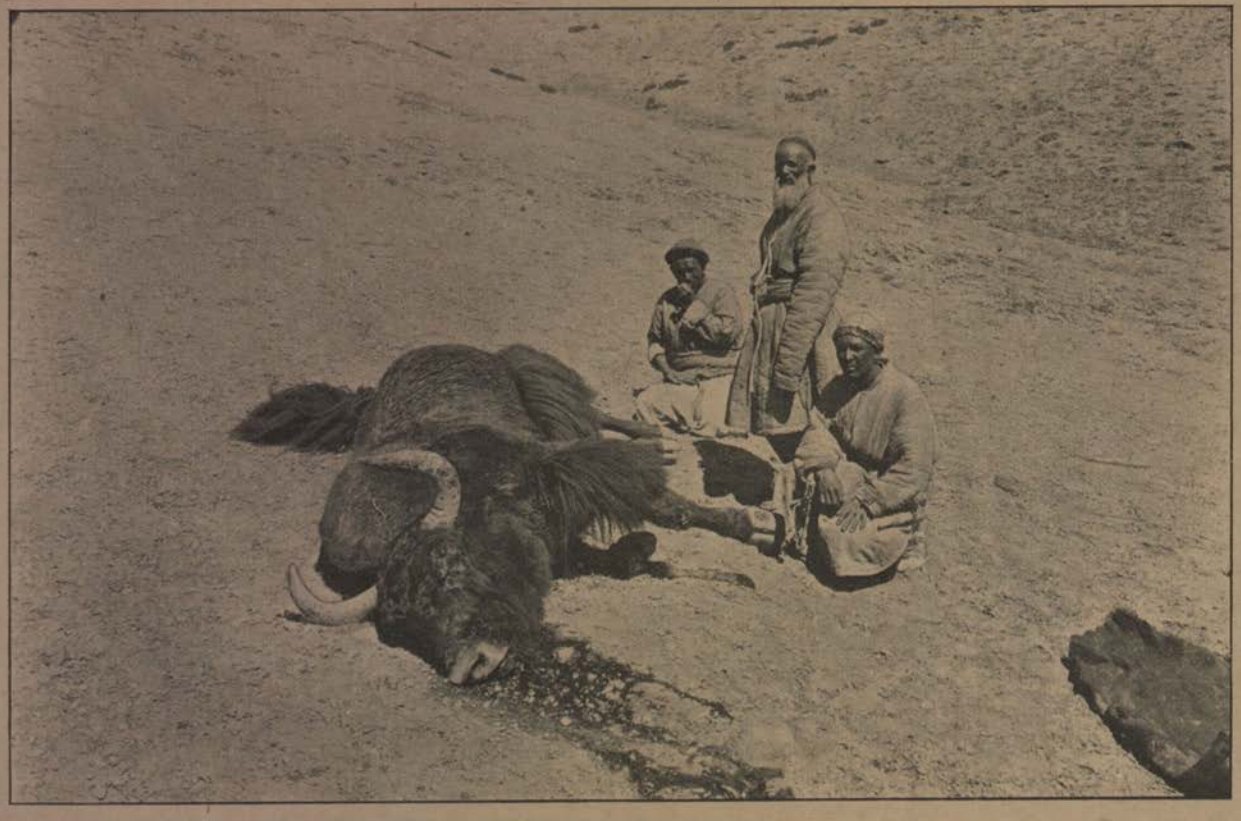
We were now travelling consistently north-west, over a tolerably open country, and consequently had no big mountain chains to cross. The temperature never rose above freezing-point all day, and the ground remained hard; but the snow hid the marmots' holes, which literally honeycombed the ground, and caused the horses very often to stumble and fall. The order of our itinerary was now three days' marching, the fourth rest. On the 16th of September our camp lay 16,395 feet above sea-level. Cherdon had carefully kept a few cartridges, but now

expended them upon a young yak, which furnished us with a good load of excellent meat. Yak beef is not good; but when you have nothing else, you cannot afford to be over nice. He also shot a wolf, which was evidently meditating designs upon our last surviving sheep. When we stopped, Aldat begged to be left all night between two camels in the open air; for the Mussulmans believe that the bodily warmth of these animals will restore health and strength to a sick man whose own vitality is slackening. So we made him comfortable amongst the camels, and left Mollah Shah and Niaz to keep him company.

Early on the morning of the 17th of September I was awakened by a terrible din in the camp: men were shouting and dogs barking frantically. I looked out, and there was a big bear slinking off, not fifty paces from the tent. His tracks in the snow showed that he had minutely examined the camp, and made a complete circuit of my yurt; but when the dogs attacked him, he thought it best to sheer off.

The weather was now fine, but the going abominable: the surface undulated and was littered all over with nasty sharp-edged pieces of tuff of all sizes and shapes. There was not a square foot of bare ground between them, and every tiny patch that happened to be free from stones was burrowed into by rats or marmots. Our animals stumbled incessantly on the sharp-pointed stones, or in the treacherous holes, and two of the camels cut the pads of their feet until they bled. After this followed a stretch of soft ground, which at first was frozen on the surface sufficiently to bear the weight of a camel, but later on it gradually thawed. At one place the last camel went through with both fore legs, and in spite of all our efforts to help him sank deeper and deeper into the mire. At last I hit upon the device of slipping felts underneath his feet as we got them up one by one, and by this means we lifted him into his usual attitude when he lay down. Then, after he had rested a bit, we induced him to make a desperate effort, by which he succeeded in scrambling on to firm ground, where he stood with the ooze dripping in clots down his legs and sides. He was literally sheathed in mud—we scraped it off with knives—and stood trembling in every limb, breathless and bewildered.

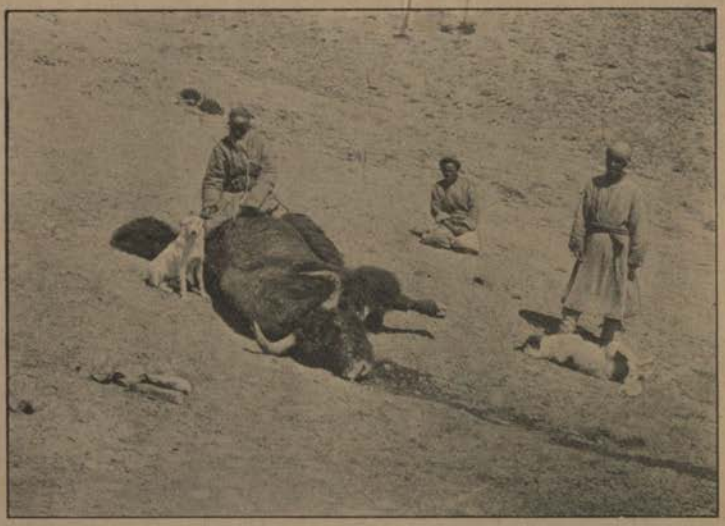
We now approached a peculiar glen, which stretched east-north-east towards a lake about six miles distant. Beyond the latter was a huge mountain-knot, draped with snow, which we had had on our right all day long, and which was clearly the



The Wild Yak Shot by Cherdon, with Mollah Shah, Turdu Bai (Standing), and Kutchuk Beside it.

same gigantic peak which I called King Oscar's Peak when I skirted its northern flank in 1896.

The bottom of the valley consisted of low-terraced table-



Another View of the Wild Yak Shot by Cherdon.

The Head and Side-fringes of Cherdon's Yak.

lands, covered with layers of tuff fifty to seventy feet thick, while blocks of tuff were scattered around in every direction. About an hour later we reached the steep edge of a second similar

glen, and so precipitous was the descent that it occasioned us a long hunt before we were able to find a suitable place by which to get down. Kulans and orongo antelopes were here numerous, and we counted a herd of forty-two yaks. The next day the sun asserted his supremacy, and we were not harassed by storms. The patches of snow that were left from the last downfall now melted and evaporated. At one o'clock the temperature rose to 12°.0 C., or 53°.6 Fahr.

In this way we plodded on day by day across the barren, inhospitable uplands of Tibet. It was two months since we had set eyes upon a human being except ourselves, and we were growing anxious to get back to our headquarters camp. But every day's march that I plotted on my map only showed how slowly we advanced, and how great was the distance we yet had to go: we were still over 240 miles from Temirlik.

Our spirits always rose with our third day's march, for everybody knew that "to-morrow we shall rest." Thus the 20th of September we spent in Camp no. LIV., at an altitude of 16,133 feet. Cherdon, using Aldat's gun, shot a fifteen-year-old yak, which I photographed in various positions before he was flayed and cut up. In the evening Cherdon came in with an orongo antelope, and we tried another Mussulman cure with Aldat. Undressing the invalid, we wrapped him in the antelope's still moist warm skin, pressing it close to his body all round. I confess I had not much faith in the remedy, and felt sick at heart at being so powerless to do anything for the man. The last evening or two I gave him a few grains of morphia; except for that he never slept a wink.

At our next stopping-place westwards down the valley, the ground was literally honeycombed with marmots' holes. One old fellow, who was basking on a hill-side in a comically killing attitude, being stretched out like a man, or at least like a monkey, was pounced upon by Yolldash. The men kept him two months and tried to tame him, but he was just as wild at the end of the time as he was at the beginning: whenever anybody went near him, he used to sit up on his hind legs ready to lay hold with his sharp fore-teeth, which were endowed with a very respectable amount of power. The marmot's bite was said to be dangerous, and the wound very hard to heal.

Where *davaghan* or marmots occur, you are almost certain to find bears; for the Tibetan bear lives almost entirely on these rodents, which he devours bones and skin and all. He doesn't

View Looking South from the Camp where Aldat Died.

stalk them down, as Yolldash did, but visits one hole after another, until he finds a victim at home ; then with his powerful claws he scratches away the soil until he is able to seize his prey. He gets, at all events, plenty of exercise before his meal, for you can always see where a bear has been by the big heap of soil he makes. Several small troops of kulans were galloping about the bottom of this broad valley. There was great natural beauty in the elegant forms and perfect shape of these animals. They would gallop in a half circle, lying over at an angle of forty-five degrees to the ground, then suddenly wheel and halt in a straight line a little distance away. Their evolutions were as regular and as well executed as if they had been ridden by invisible Cossacks.

To-day Aldat was able to sit on horseback, although he had to be tied on fast and well looked after. We all hoped that he was improving, but in the evening he grew worse again. Every breath was accompanied by a groan, and he breathed at the rate of fifty-eight gasps a minute, which even at the height of 15,873 feet above sea-level was abnormal. On the other hand, his temperature was remarkably low, and the most strained attention failed to detect the least sign of his heart beating, and his pulse was correspondingly weak. His intellect still continued clouded : he kept talking about wanting to go out and shoot yaks. Although it was a violation of the order of our itinerary, we halted for a day for his sake, notwithstanding that we had only bread to last two or three days longer, and a dozen more shots would completely exhaust our ammunition.

Although on the morning of the 23rd the invalid's condition was scarcely changed at all, except that he now took his breath twenty-four times in a minute, we resolved to continue. It was evident he could not last very much longer, but we were unable to wait. We packed him in between two bags of fuel, putting soft felts underneath him, and wrapped his feet in carpets, and rolled up a fur and put it under his head for a pillow, then lashed the whole fast with ropes on the back of a camel.

Just as the camel was getting on to his feet to start, Aldat ceased to breathe. His broken eyes—beautiful grey Afghan eyes they were—were fixed afar off upon a country which our glances were unable to reach. He who formerly had ranged over these stupendous uplands with light and hurrying footstep on the trail of the wild yak had succumbed to the hardships of his calling, and closed a life which had been exceptionally lack-

ing in pleasure. "Ghetti!"—*i.e.*, "He is gone!"—whispered the Mussulmans, as they stood in silence round his strange death-bed. But Turdu Bai, looking at the matter from the practical side, asked me what we were to do with the body. I was reluctant to bury him in unseemly haste, and all the men were quite satisfied when I gave the order to start. The camel had carried him several days, and he was not a heavy load. I had promised the men that they should be at Temirlik in eighteen days, which would allow us six rest days, if we travelled at the rate of fifteen miles a day. Consequently, they counted them with growing interest, and were anxious not to lose a single hour.

CHAPTER XXXVI.

STRUGGLING BACK OVER THE TIBETAN BORDER RANGES.

WHEN we started again, making for a large lake lower down the valley, our caravan was converted into a funeral procession. The men no longer talked, but were silent and grave. Kulans and yaks grazed unmolested near our line of march. The ravens of death hovered around us in wide circles. The lake shore was hard and afforded excellent going. The water was salt and bitter, and had a temperature of 16°.6 C., or 61°.9 Fahr., which was abnormally high when compared with the mean temperature of the air at that season of the year. It was, I dare say, partly a consequence of the high temperature of the lake, combined with the absence of wind, that this day, at one p.m., the temperature rose to 17°.5 C., or 63°.5 Fahr.

After passing the lake, we continued, still towards the north-west, over a gently-rising, undulating tableland, furrowed by numerous watercourses, with treacherous mud at the bottom. Beside one of these we came across a small piece of wood belonging to a Mongolian pack-saddle. It was as soft as cork, and must have been dropped either by a pilgrim caravan which had strayed this way from the north, or by Captain Wellby and Lieut. Malcolm's caravan, the route of which we crossed somewhere this same day. When we stopped, Mollah Shah and Niaz dug a grave for Aldat, whilst the other men were about their usual duties. After putting in one skin underneath and another on the top of the corpse, they shovelled in the soil, and made an oblong mound above it; and so we left the dead man to his last long rest in the moist and treacherous earth. It was the simplest burial I have ever been present at—no ceremonies, no tears, no prayers, except those I silently breathed for the peace of the dead man's soul. Beside the grave we set up one of the tent spars, and fastened on the top of it, by way of *tugh*,

one of Aldat's own hunting trophies, namely, a yak's tail; for this is the usual headstone to a Mussulman tomb. But I scratched on a small piece of wood, in Arabic and Latin lettering, the dead man's name, as well as the date, and my own name, in case destiny should lead any traveller to the spot before Aldat's burial mound becomes finally levelled down.

Later on I was able with my own hands to give to Aldat's brother, who met us in the Chimen valley, the dead man's gun, the wages which were due to him, and his clothes and furs. His old father, Eisa Ahun, son of Dill Mohammed Khan, visited me a year later at Charklilik, and it was a relief to me to know that Aldat's mother was dead, and so spared the grief of losing such a handsome and splendid son.

On the 24th of September the men were ready to start at an unusually early hour, being anxious to get away as soon as possible from so sorrowful a spot. After the Mussulmans had repeated a *dua* or prayer over his grave, poor Aldat was left alone with the mighty silence of the hills; no pilgrims, except the wild beasts of the wilderness, would hereafter visit his grave. The last we saw of it was the black yak's tail fluttering in the breeze as we dipped below the hills in the west.

We now set ourselves resolutely towards a yawning ravine or gateway in the mountain-range in front of us. But it was no easy matter to reach it. The ground consisted of loose red sand, furrowed by a great number of deep trenches, 100 to 150 feet deep, with precipitous sides and a treacherous morass at the bottom of each, in which we should of course have perished, man and mouse, had we once dropped into them. The glen, which we finally reached after very great difficulty, led gently up to a double pass, beyond which we halted for the night.

The following day we threaded a series of small passes or gaps in a number of minor parallel chains; but when at length we were gratified by the sight of open country, namely, a broad atitudinal valley, stretching as usual east and west, all vegetation had come to an end. Although we had done a good day's work already, we nevertheless pushed on diagonally across the valley, riding for several hours on its hard floor before we reached a fresh-water pool, with a few blades of grass beside it. That day we did 19¼ miles.

As we approached the Arka-tagh the country grew more and more desolate. On the 27th of September we did not see a blade of grass anywhere, nor a single trace of any other kind

Camp no. LX., 16,769 feet Above Sea-level.

of vegetation, or the least indication of organic life. Up and down we went, over the mountains and across the valleys, traversing them all at right angles. No sooner did we get down to a stream than we had to begin to work our way up on the other side of it, and although the difference of elevation did not exceed 350 feet, the climb proved a tremendous strain when it was repeated time after time without variation. After many tiresome detours and halts we at length reached the summit of the new range, situated 17,071 feet above the level of the sea. Immediately north of it was a solitary ridge, which we were forced to double either east or west. I preferred the latter, and rode on a long way in advance of the caravan, until it grew dark, when I stopped and waited for them at an altitude of 16,769 feet. They came in in small parties, all dead beat, and reported that they had left behind, in a hopeless condition, a white horse which we had brought from Yanghi-köll. Besides this, two camels and one horse were suffering from some affection of the eyes; they nodded their heads when they walked, as if they were suffering from want of sleep.

The next morning we were again in the midst of winter; but the clouds soon disappeared, the wind dropped, and the sun came out and proved scorching hot. At such moments the black bulb thermometer used to register up to 70°.0 C., or 158°.0 Fahr. When we stood and watched the patches of snow attentively we could actually see them dwindling before our eyes. Kutchuk went back to fetch the white horse; but although he was still alive, he fell down and died on the way to camp.

We descended into the next latitudinal valley through a narrow gorge shut in by red cliffs, consisting of sandstones and shales. The brook which flowed along the bottom of it had frozen during the night. As long as we were in the deep cutting, we were in shelter; but as soon as we emerged into the open the caravan was caught by the full force of the gale, which was just beginning, but rapidly increased to a westerly hurricane of the worst description. We had to sit tight to prevent ourselves from being actually blown out of the saddle. Horses, men, and camels—all bent over and literally lay *upon* the wind. The entire caravan was blown sideways. Horses' tails and loose ends of clothing flapped and fluttered like streamers down the wind. It was hard work to get our breath: we were nearly choked. The camels were blown from side to side as they lurched along. The valley in front of us was shrouded in mist,

so that we were unable to see which way to go. But the first bite of grass we came to should, I resolved, be the signal to stop; for it was impossible to travel far in such a gale. Those who have never been in one can form no conception of what it is like. It was as though the entire volume of the atmosphere were concentrated into this great trench of the earth's surface and forced through it like a roaring tide. The clouds drove overhead at racing speed; drift-sand—nay, actually small stones were caught up from the ground, and hurled point-blank into our faces. In the more exposed situations the wind had a velocity of over 55¾ miles an hour; but after we got in the shelter of some low hills, beside a little brook at the bottom of the valley where we encamped, it dropped to 31½ miles an hour.

Owing to this fickle weather, and these abrupt and violent changes of temperature, our skin grew very sensitive. The nose and ears suffered most, the skin peeling off time after time. Our nails turned as brittle as glass, and split and cracked; and there was constant pain in the finger-tips.

Several of our horses were now in a bad way, and as we had only maize enough to last two days more, I directed one of the men to see if we could not spare some of the rice for them. Our smallest mule very nearly gave up at this camp, No. LXI. (16,100 feet), but was saved by Cherdon, who treated her according to a practice of the Buriats. She was swollen up to an enormous size, and lay writhing on the ground. The Cossack took an awl and with a powerful push thrust it into her side up to the hilt. The gas streamed out, but not a drop of blood. Then we forced her to stand up, flung a rope round her hind quarters, and whilst one man pulled at her head, another whacked her with a staff. Every time she kicked out behind, two other men pulled away at the rope, so that in this way she was forced to move forwards, swinging from right to left. People may say what they like about this method, but it certainly proved a sure cure in her case. She recovered, was with me when I rode towards Lassa, took part in my journey westwards across Tibet to Ladak, went over the Karakorum Pass, and when I last saw her in Kashgar, at the end of May, 1902, she was in first-rate condition.

After a day's rest, we set to work in earnest, on the last day of September, to scale the entrenchments of the Arka-tagh. Following the eastern shore of the lake of Camp no. LXI., we made for what appeared to be a suitable pass, but were com-

pelled to circle round a creek or bay, which the lake sent out towards the east, and which was entered by a stream at its extremity. This bay was almost a separate lagoon, and contained fresh water sheeted with ice, whereas the ice itself was strongly saline, and when melted yielded water with a specific gravity of 1.0225. The west was shut in by vast snow-capped mountain-masses belonging to the Arka-tagh. We found a good road up to the top of the range in a deeply scarped watercourse, the bottom of which was littered with hard débris, while numerous small lateral glens entered it from both sides. I led the way with Cherdon and Mollah Shah. At three o'clock it clouded over, and became almost dark. The pass was easy to ascend from the south, and we had no difficulty in reaching the summit; but the north side, where the strata cropped out along the strike, was fearfully precipitous.

This range, which overtops almost all others on the globe, resembles a colossal springboard, from which you might take a leap into the void spaces of the universe. Just as we reached the summit, the snow-storm was raging its worst. I thought we were lost. The altitude was 17,071 feet, and I had scarce strength to make the necessary observations; my hands were stiff and entirely destitute of feeling. As the caravan lingered I sent the two men back to see what had become of it, and sat down with my back to the storm to wait for them. The snow whirled about me in huge plumes or tassels, while the abyss at my feet was a seething caldron of tossing snow-flakes. The wind howled and whined and whistled, as it swept over the sharp-cut summit of the pass. At last I heard the camels' bells close beside me—the animals flitted past like spectres—I did not hear a footstep. Turdu Bai marched leaning far forward, with one arm raised as if to protect his face: he walked as a man does when he forces his way through a dense thicket. But how to get down on the other side of the pass? It was like plunging headlong into a black abyss, the bottom of which we were unable to see.

All the men went on foot, so as to be ready to help and support the camels. Kutchuk went first, feeling the way. He took the descent zigzag and at hap-hazard. At every ten or a dozen yards we were forced to stop and rub our faces with snow to prevent them from freezing. We slipped, we slided, carrying the snow with us. One of the camels stumbled, fell, turned half a somersault, but, luckily, lay in such a position that he

was able to get up again without being unloaded. The snow whirled madly around us; we gasped for breath; everything danced before our eyes. By this the day was well advanced and it grew dark; nevertheless we persevered until the slope began to grow easier. It was pitch dark when we stopped on the flank of the mountain, at an altitude of 16,330 feet. Here there was not a blade of grass, nor a handful of fuel, though of water we had plenty in the shape of snow and ice. Indeed, we had more than enough, for the ground was as white as could be, and the skies were emptying out showers unceasingly upon our devoted heads.

When the sun rose on the 1st of October, we were enabled to see what sort of a place it was where we had stopped in the darkness of the night before. It was still snowing, and the landscape wore a decidedly wintry aspect. The animals were stiff with cold, and hungry, when we started down the chilly valley. As soon, therefore, as we reached a patch of scurvy grass we stopped, at an altitude of 16,074 feet, although we had only gone a very few miles. I gave the order to slaughter our last sheep; but it was like a stab into my own heart. I felt as if I were committing murder.

On the 2nd of October we travelled 18½ miles north, our track at first going downhill, until we reached the hard gravel at the bottom of the valley. We were still unable to see much of our surroundings, because of the blinding snow. The valley, with its gentle fall, gave us friendly help for yet another day. When the air cleared, we perceived the Chimen-tagh a good 60 miles away. But before we started on the second morning, the usual westerly storm was once more on its way to freeze us as we sat astride our wretched beasts. We saw the forerunners of the storm racing each other a long way off across the open spaces behind the projecting cliffs and in the throats of the glens.

We were following a little brook, and ought to have stopped as soon as it came to an end; but, perceiving a lake, the Achik-köll, further north, we hoped to reach it and find fresh springs there. The poor animals were thoroughly exhausted. The horse I had ridden to Andereh lagged behind with Niaz, and another horse, a white one, was left on the road in charge of Kutchuk. It grew dusk, and then dark; but the moon soon came out, and shed her pale spectral light over the frigid waste. As we failed to discover water, we passed the lake, leaving it

a good bit on our right. Turdu Bai was leading the way on foot, and we were all overjoyed when he at length stopped and shouted that he had reached a stream which flowed into the lake. We had marched 23¼ miles, the utmost that our animals were now capable of doing in a day. The sick horses did manage to reach Camp no. LXV. (13,948 feet), but it was well on the next day, for the men had been obliged to leave them some way back all night. We tended them the best we could, feeding them with rice.

The basin of the Achik-köll was of very considerable extent, especially to the east and the west. From the latter direction it received a large stream, on which, when we forded it on the 5th of October, a good deal of drift-ice was floating. The basin lay ensconced between the Arka-tagh on the south and a smaller range on the north, the latter of which did not appear particularly difficult to cross. On the morning of the 6th, the whole basin was shrouded in a peculiar cold, moist, clammy mist, and through it the picturesque outlines of the range on the north were but faintly and dimly seen, painted, as it were, with evanescent colours on the canvas of the sky, with the snow etched in more strongly higher up. Owing to these subdued tones the range appeared to be at least a day's march distant.

The caravan was dying, and we breasted the new slopes at a funereal pace. The district was dotted over with hundreds of kulans, and more particularly with orongo antelopes. Yolldash managed to catch one of the latter, and held it fast by the nose until Cherdon came up and killed it. Its meat was very welcome as a change in our monotonous diet. The ascent grew steeper. We crossed an endless number of ravines and passes, where we had to make frequent halts to let the animals recover breath. A man came to tell me that one of the horses was unable to go any farther. No sooner was it slaughtered than down went another, never to get up again. This miserable pass would have been a mere trifle for animals in good condition; but before we surmounted it we lost two more horses, one of them being the faithful grey which had carried me to Cherchen, and then to Altimish-bulak. And when we did at last surmount it, the prospect was not a whit more encouraging. To right and to left were glacier-arms, in front of us a chaos of mountains. Just over the top we halted in a recess of the rocks, although there was not a scrap of firing or food for the animals. Next morning one of the horses was lying dead, his neck stretched

out, his eyes fixed, his body stiffened with frost. It was evident we could not go on long in this fashion. Our marches were growing shorter and shorter, and the animals were getting utterly exhausted and worn-out.

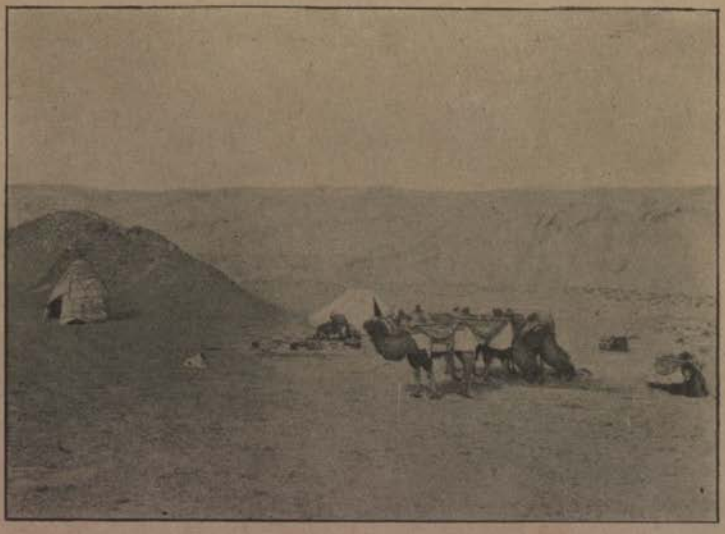
Curiously enough, all the camels struggled over this fateful pass without any damage. In the morning we found them lying motionless, and with marvellous resignation, in the same attitudes in which we left them the night before. They were powdered with rime-frost, for the thermometer had not risen above $-3°.8$ C., or $25°.2$ Fahr., and there was an icy, cutting wind. We followed the valley towards the north-east, the country remaining absolutely barren and totally destitute of game. The only sign, I will not say of life, but simply of movement, was the stream breaking against the water-worn blocks of granite, some of them as much as a cubic yard in dimensions, which littered the watercourse at the bottom of the valley.

The night of the 8th of October was still and cold and bright, and the thermometer went down to $-18°.3$ C., or $-0°.9$ Fahr. An icy current of air, the usual night breeze, swept down the valley. From this sharply-defined valley a fresh caravan would have made Temirlik in four days; but it would clearly take us a good deal longer than that. We had only six small pieces of bread left, though our rice would last for three or four days longer. It looked as if we should have to do the last stage or two on famine rations. A little fuel, too, would have been extremely welcome; but, unfortunately, this region was never visited by yaks.

We resumed our way down the valley in a howling snowstorm. Very soon the valley contracted to a gorge, the bottom of which was impeded by cumbering masses of rock, in part water-worn, which had toppled from the heights above. In fact, we were threading a deep transverse glen cut through the granite, and the scenery presented all the characteristics usual in a granite region—rugged, pinnacled forms, at once capricious and picturesque. The stream was for the most part frozen over, although at the cascades we could see it rippling along underneath the transparent bridges of ice. We crossed it a great number of times, our object being to keep as far as possible along the same level on the erosion terraces between which it flowed. Very often the ice was strong enough to bear even the camels; but where it would not bear them, we broke it up

with poles and stones. The veterans amongst the camels traversed this difficult piece of road in a wonderful way, especially as they now carried bigger loads, in consequence of the horses having died.

The name of the glen was Togri-sai, or the Straight Glen; and it was very well known to the gold-seekers of Cherchen and Keriya, for it contained a gold-field, which we passed in the course of that day's march. The miners seemed to have been there only about a month before; but there were no indications of the valley having been visited since. About halfway up the glen we came to the first three huts, built of granite.



Our Camp at Togri-sai on the 8th October, 1900.

Close beside them were a great number of pits in the gravel beds, surrounded by mounds of sand and gravel, which the miners had dug out. There were several hundreds of these pits, very few of them, however, more than eight feet deep. Most of them were abandoned long ago, but others appeared to have been worked that very summer. The huts were merely temporary affairs, four square, the sides 6 to 10 feet long, the walls composed of unhewn blocks of granite, without any sort of binding material. The roof consisted at the best of a piece of linen or felt flung across a spar. Lanes and alleys wound in and out amongst the gravel-heaps of this Asiatic Klondyke; and beside some of the mines there hung an antelope's skull

or a kulan's skin, fastened to a stake, in sign of ownership. In some places the owner of a claim had surrounded his property with a low wall of unhewn granite.

Some of the huts contained primitive ovens for baking bread, for the miners bring flour with them; but for the rest of their food they depend upon the hunters who accompany them, and who for a trifle sell them the flesh of the yaks, kulans, and antelopes they shoot. The miners convey their paraphernalia on the backs of asses, which they then send down into the valleys to graze during the two months that their work lasts. We found household utensils in only two of the huts—namely, a few rough rakes, used in separating the gravel from the gold-bearing rock, a wheelbarrow, two or three ridge-spars, and a trough for baking or washing gold. We had no scruples about appropriating this excellent material; it would keep us warm for two or three days.

One of the camels here gave up and was left behind, until we should find an opportunity the next morning to fetch him in. We advanced terribly slowly in the bitterly cold weather, with snow falling and 3° C. (=5½° Fahr.) of frost. At a steep place one of the camels stumbled and rolled down the face of the slope, turning over several times, but happily he took no further harm. This misadventure cost us an hour, for we had to make a road up the cliff to get him back again. It was 11 o'clock at night when we encamped (14,814 feet) after this long and tiring, though interesting, day, and the moon was already shining out of the snow-clouds.

CHAPTER XXXVII.

BACK TO HEADQUARTERS AT TEMIRLIK.

THE camel which we had left behind died during the night. Of our original caravan there were now left only six camels, three horses, and one mule; and even they were all in a pitiable condition.

The valley widened out again, and ascended by three broad, step-like terraces, twenty-three, forty, and fifty feet high respectively. It was no use pushing on in the hope of finding grass, the animals were dead beat. We were forced to let them rest where they were, feeding them upon the stuffing of the last of our pack-saddles. The next day, the 10th of October, we continued our slow and weary tramp north-north-east along the same valley. I also went on foot now, so as to spare the one horse that was fit for duty. The river was frozen, for the temperature had fallen to —18°.8 C., or —1°.8 Fahr. At starting the sky was clear, but it was not very long before the everlasting westerly wind began to make itself felt. Happening to cross over to the right-hand side of the valley for the purpose of examining the lay of the strata, I lighted, by pure chance, upon some exceedingly interesting rock-drawings. They were made on the surface of what had once been a light-green slate, though it was now stained dark brown, and polished bright by wind and weather, and as the outlines had been cut through the outer laminæ of the rock with a sharp instrument they were very conspicuous, owing to the light incised lines showing against the dark background. They must have been of considerable antiquity, because portions of the pictures were obliterated.

They represented scenes from a hunter's life, and he must have been an enterprising fellow. He would seem to have hunted yaks, kulans, orongo antelopes, and wolves in the mountains, and wild duck, wild geese, and tigers beside the lake of Lop-nor.

One especially noticeable fact in connection with them was that the hunter represented carried in every case, not the Central Asiatic musket, with its forked rest, but bows and arrows, and the long arrows had their barbs pointing forwards, like the trident of Neptune.

Although consisting of a few strokes of bare outline, the animals were drawn in a characteristic and easily recognisable manner. The hunters were represented in different positions, standing, creeping, kneeling, and the one who was aiming at a tiger considered it safest to keep to his saddle. The rock faces on which this work of art was engraved were three and a quarter feet and five feet high, and the pictures very nearly a foot in length. There can be little doubt that they date from a period when Mongols still dwelt around Lop-nor, and probably spent a portion of the summer in the mountains. And at our next camp (13,344 feet), on the left bank of the stream, where the grass was tolerably good, I found strong confirmation of this assumption in a Mongol *obo*, or cairn, built of flat slates and inscribed all over in Tibetan lettering with the fundamental dogma of Lamaism: "On maneh padmeh hum"—which means, "O jewel of the lotus flower!"

These traces of human occupancy invested the place with a certain degree of interest, and we spent the next day beside the *obo*. But before that day came to an end, our position underwent a great and joyful change. Cherdon, with Aldat's last charge of powder, had just brought down a young kulan quite close to camp, when Mollah Shah came running to me to tell me breathlessly that he had seen, a long way down the valley, two hunters on horseback. I at once ordered him to go off after them, and bring them back with him at all costs. At first the men were rather shy, but soon recovered confidence, and told me that they had spent three months in the mountains, supplying the miners with kulan meat. But they had not been to Temirlik, so that we were still ignorant as to how our headquarters had fared during our absence.

This unexpected meeting with human beings, after being isolated from our kind for eighty-four days, put fresh life into us all. The first thing I did was to buy their two horses, which were as English thoroughbreds in comparison with ours. A small parcel of wheat flour also proved an exceptionally welcome acquisition. But what interested us most was the palaver which was held that evening round the camp-fire. Mollah Shah

An Obo at Camp no. LXXI., the Lower Togri-sai.

had already offered to tramp all the way on foot to Temirlik, and send a relief caravan to our assistance. But there was now no need for him to do so. Togdasin, one of the hunters, knew the mountain paths better than he did; so I gave him his own horse, which I had just bought from him, and sent him to Islam Bai with a message. He promised to be there in two days, and was instructed to tell Islam Bai to meet us with fifteen horses and a goodly supply of provisions at the springs of Supa-alik, two days west of Temirlik, in the Chimen valley. Togdasin set off at eleven o'clock at night, taking with him two empty preserved fruit tins by way of credentials, to show

A Young Kulan (Wild Ass).

that he was an express courier from me; they would also serve as a hint to Islam Bai to bring with him a fresh supply of the same kind. Togdasin took nothing with him to eat, except a small piece of kulan flesh. I did not envy him his night ride, seeing that the night before the temperature had fallen to −20°.2 C., or −4°.4 Fahr.; but I promised him a handsome reward if he executed his commission well.

The next two days took us to the end of the Togri-sai, and a good bit along the Chimen valley. Into this latter the Piazlik, the imposing mountain-chain which overhung the valley on the south, and thus formed the continuation of the Chimen-tagh, thrust out across our path a long series of rectangular spurs *en échelon*, consisting of sharp-pointed irregular rocks of a brown,

grey, or black colour. Our spirits rose high when we started on the 14th of October, nor were they in any degree damped by the fact that we all had to walk, for according to our calculation we should meet the relief expedition at nightfall.

The stream which descended the valley carried about 177 cubic feet in the second, and we kept to its left bank. On our left rose the Illveh-chimen, with its snow-capped peaks. Its flanks were scored by an endless number of dry ravines, each of which we had to cross over, and this occasioned us an infinite amount of trouble. But after we crossed the last of them, the ground became perfectly level, and the going first-rate. Mollah Shah assured me, that about twilight, and before it was dark, we should reach the springs of Supa-alik, the appointed rendezvous ; but it was evident he did not know the country, and the second hunter who had only accompanied us for two days had now left us. It grew dark—it grew pitch dark—and yet we failed to find any springs. On the contrary, the path we had hitherto followed gradually came to an end, and although there were yappkak bushes at intervals, there was not a blade of grass. But, thanks to the splendid hard surface, the animals held out well through this long tramp.

However, at the end of about another hour and a half, Mollah Shah and Niaz, who were leading, stopped and shouted that they saw a fire in the distance. This news electrified us, and we quickened our pace. It was as though all our toil and privation were suddenly come to an end, and we had no further need to exert ourselves. We pushed on through the darkness straight towards the fire, which drooped, then flared up again. I walked beside the camel that carried the skiff, and held on to it, until my hand got numbed with cold ; then I went round to the other side of the beast and held on with the other hand, whilst the first thawed and got warm. Then for a long time we failed to see the fire, and our hopes drooped, and we became doubly sensible of our weariness. Perhaps, after all, the fire belonged to some gold miners. We stopped and shouted. We gathered a bundle of yappkak and made a big blaze, but there was no answer to our signal. We fired two or three shots from a revolver, but the sound died away into space, without awakening so much as an echo. We held our breath and listened. The night was as silent as the grave, and the fire went out.

When we started again away from our own fire, around which we had warmed ourselves for half-an-hour, the darkness seemed

even intenser than before. In fact, I involuntarily glanced up at the stars to convince myself that I had not been suddenly smitten with blindness. Hour after hour we plodded on, dragging our weary animals after us, which, as they did not refuse to follow, probably scented grass.

Again the fire flared up. The men, who had been plodding along in dogged silence, once more became lively and talkative. Soon after this we came to some *malgun* bushes, a sure indication of the vicinity of water. Then the deceitful fire faded once more, and finally it disappeared for good. Every five minutes or so the men shouted all together as loudly as they could, but their

The Illveh-Chimen Seen from the Chimen-tagh.

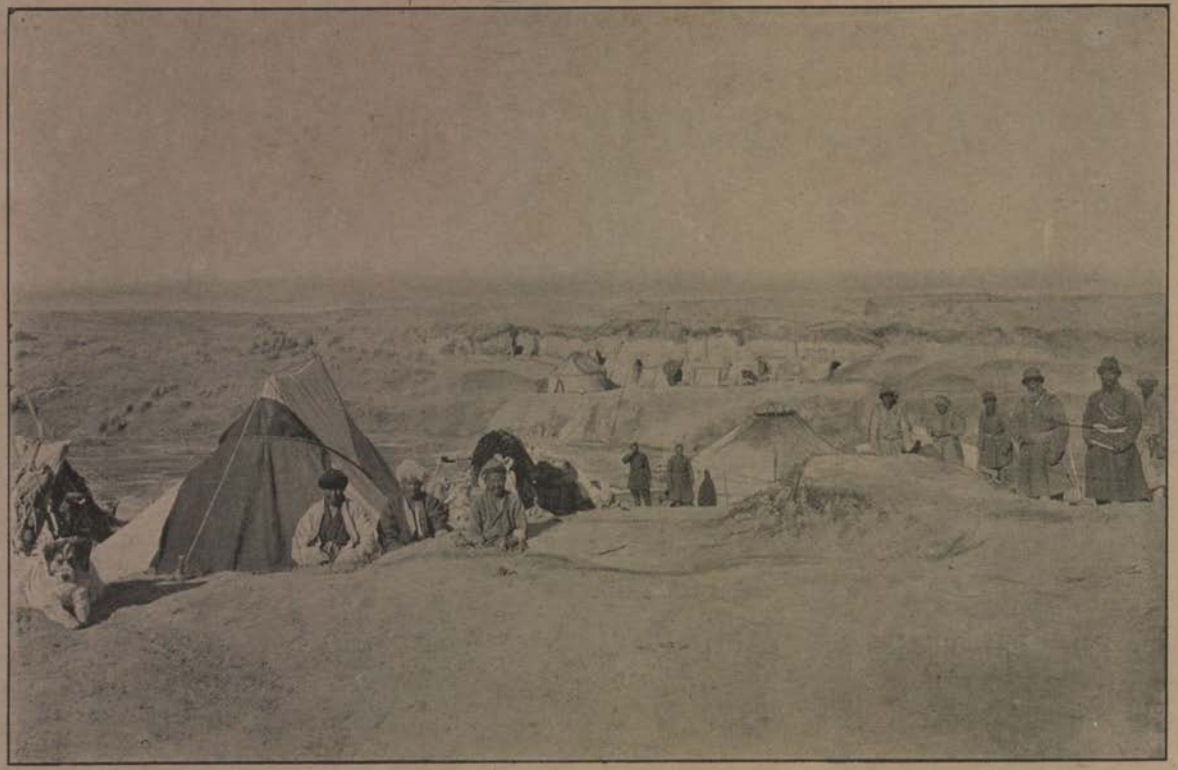
voices died away in the night unanswered. I was beginning to believe we were being deceived by a will-o'-the-wisp, which flitted on in front of us and disappeared just before we reached it. Our patience had been too severely tried; as the fire died out, so did our interest, and then fatigue finally got the upper hand. As soon as we reached the next belt of bushes, I commanded halt, to the intense satisfaction of everybody concerned. But although we had been on foot for over twelve hours, we had not accomplished more than 26¾ miles.

We were all completely done up, men and animals alike, and were in a truly pitiable plight; too far gone, in fact, to arrange camp. The men just sat down on the ground, on the very spot where each happened to stop. We had only one can

of water left, which we had brought from the last river, and with this each of us got one cup of tea ; that, and a bit of kulan meat roasted over the fire, was all we had left. On the off chance that relief might be in the neighbourhood, we kept up a big signal fire for about an hour and half. Then we dropped off to sleep, in a kind of swoon, with the frosty stars glittering above our heads. We had by this got down to 11,388 feet above the sea.

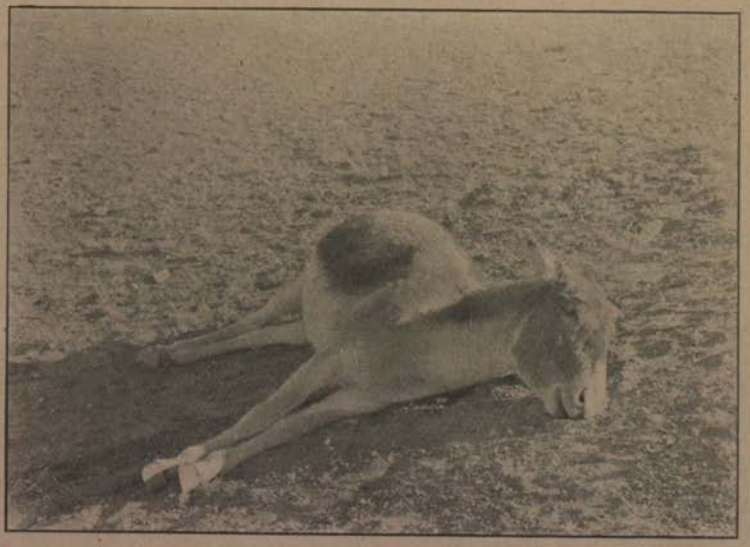
Next morning, the 15th of October, the men found a fresh-water stream not more than two hundred paces away, and as the situation was all that could be desired for a camp, there being an abundant supply of rich tall grass and plenty of fuel, we decided to stay there over the day and see what would happen. Mollah Shah, who had been out to reconnoitre, came back and said that the deceptive fire of the night before had been made by a party of hunters, who were on their way back to Cherchen with a load of skins, and had deliberately kept out of our way, not knowing who or what we were. Here we were, then, once more thrown back upon ourselves. What were we to think about the relief caravan ? and how far dare we trust to our messenger, Togdasin ? Cherdon, who had got from him a handful of powder and a little lead, spent the whole morning looking for an antelope, but returned at two o'clock empty-handed. This region was frequently visited by hunters, and the animals were shy and difficult to get near, but he said he had seen a dark-coloured something moving a long way off in the west, which he had at first taken for a troop of kulans ; but he now believed that they were horsemen, and that they were approaching our camp.

I hurried out with my field-glass, and sure enough there was a troop of mounted men galloping towards us in a cloud of dust. Running to the top of a little hill we watched them with bated breath. They were still a long, long way off ; but we could see them distinctly over the tops of the thicket. Owing to the mirage, they seemed to be travelling a little distance above the earth, but their bobbing movements showed that they were riding at a gallop. They disappeared amongst the thickets, but the cloud of dust which they sent up showed which way they were coming. It must be our friends, who, having failed to observe our signal fire, had started at daybreak, and pushed on until they came across our trail, and had then turned back and followed after us.



Our Headquarters at Temirlik. In the Background my Yurt and the Terrace with its Caves, and in the Far Distance the Akato-tagh.

Our excitement reached a climax when we saw two mounted men emerging from the bushes. Then appeared two others, driving a troop of horses in front of them—all coming at full gallop. But I soon recognised Islam Bai by the skin hood of his cloak. He was leading on a white horse. He quickened his pace, and soon outdistanced the others, and, dismounting a little way off, saluted. He looked well and pleased, and announced that all was well at headquarters. The other three men were Musa from Osh, Khodai Värdi, and Tokta Ahun from Abdall. It was, after all, their fire which we had seen ; and they, as we supposed they would do, had pushed on westwards during



A Dead Kulan.

the night, until they came to our trail, when they at once understood that we had gone past each other in the darkness.

Islam Bai brought with him fifteen fresh horses, all in splendid condition, and a good stock of provisions, and at three o'clock we had a thorough Lucullan feast. He brought nothing but good news. The post-jighit Yakub had arrived from Kashgar, and in an instant I was tearing open letters and newspapers from my home in far-off Sweden. Shortly after we left Mandarlik, Islam Bai had shifted camp to Temirlik, pitching his quarters beside some Mongol caves or grottoes. The *amban* of Charkhlik had been to visit me in state, and so had the Mongol chieftain of Pshui in Tsaidam ; but both had, of course, returned

without seeing me. The former brought with him thirty ass-loads of maize. For the last two weeks Islam Bai and the others had been in a state of the greatest anxiety about us, for we had promised to be back in two and a half months at the outside, and they knew our supplies must be exhausted. Thus question and answer flew backwards and forwards for hours, and it was late when I got to bed that night. But the men sat and talked long after that, around a rousing big fire, which there were now plenty of hands to feed. Kader Ahun, Aldat's brother, had come to Chimen to meet him. He surprised me by saying that he was fully prepared for the sorrowful tidings; for some little time before he had dreamt he was riding across a broad tableland and met my caravan. But when he looked for his brother amongst the men, he could not find him, and when he awoke he knew that some misfortune had overtaken him. We made out that he had the dream precisely at the time of Aldat's death, and Shagdur was in a position to prove that the man's story was not invented. For Kader Ahun told his dream to the Cossack long before they had any intelligence of our return, and Kader Ahun added at the time, that he believed Aldat was dead. This was the only instance of telepathy which has come under my observation throughout my journeys in Asia.

After two days' rest, during which I took an astronomical observation, we rode, on the 18th of October, thirty miles to the east, across barren deserts and sand-belts, leaving the camels and surviving horses of our caravan to follow slowly on in our wake, but without loads. It was delightful to have a good fresh horse to ride on; and I was also glad that our surviving animals would now have a good six months in which to rest and graze at leisure. And well they deserved it!

On the 19th we rode along the right bank of a stream which bathed the southern foot of a small detached mountain group, and then shortly afterwards disappeared amongst the sterile gravel at the bottom of the valley, without reaching any of the lakes which lay further east. Upon reaching a wretched little oasis in the midst of this desolate region, called Bagh-tokai, or the Orchard Wood, we met eight men returning from Bokalik to Cherchen, carrying with them the skins of eleven yaks, four kulans and two orongo antelopes, which they had shot. We gave them what rice we could spare, for they had lived all summer on yak and kulan meat, and we knew how pleasant a thing it is to have a change in a monotonous bill of fare.

Our caravan had once more increased to an imposing cavalcade, when, on the 20th of October, we at last turned our faces north-north-eastwards towards Temirlik. But we were not to reach headquarters without a final salute from our all too pertinacious friend, the west wind.

Shagdur met us half-way, and pulled up and saluted in military fashion, as if he and his horse had just been cast in bronze. We were both glad to meet again, and he had a good deal to tell us. He had kept the meteorological records with exemplary care, and the self-registering instruments had never once failed. It was getting dusk when we at length reached the

Turdu Bai Guiding the Camels.

spring of Temirlik. There I was met by Faisullah and Kader, both of whom had been with me on the ferry-boat, and they pointed out to me the six camels which had been out at grass all summer. On the right bank of the little brook which issued from the springs several fires were scattering their sparks into the air; it was the tented village of our new headquarters camp. Besides the big Mongolian yurt there were two tents, a hut made of reeds and branches, long rows of maize sacks, and all the heavier baggage. Here I was greeted by Ali Ahun, the tailor, and Yakub, the post-jighit, as well as by a crowd of old men, chance visitors, whom I had never seen before.

Over on the other side of the brook was a two-storied loess

terrace. On the lower platform my little yurt was already put up, with the stove lighted inside it. In the vertical face of the upper platform the Mongols had, in time past, hollowed out a number of caves or grottoes. One of these Shagdur had converted into a very convenient dark room for photography, and got everything ready for developing the plates which he knew I should bring back with me.

Thus ended this toilsome journey, and we could now with a good conscience indulge ourselves in two or three weeks' rest. The expedition had resulted in geographical discoveries of very great importance, but it had entailed a considerable amount of hardship and suffering and loss of life. Of the twelve horses we started with only two were now left, and of the seven camels only four; and of these four, one stood like a bronze statue for two days amongst the long grass, and on the third day lay down and died, without having attempted to bite a single mouthful. And last, though by no means least, it had cost the life of one man.

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